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MADNESS

THE CASTING OFF OF THE SHIPMENTS OF THE INSANE
AT THE END OF THE MONTHLY PERIOD.



MEN AGAINST MADNESS

BY

LOWELL S. SELLING
M.D., PH.D.



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CONTENTS

| | |
|--|-----|
| FOREWORD | ix |
| I. AT DAWNING | i |
| The earliest dawn-men of prehistoric time recognized madness and tried to treat it . . . the great Greek physicians had a cure for it. | |
| II. MADNESS IS IN THE BRAIN | 18 |
| Leonardo and the artist-anatomists of the Renaissance try to probe the secrets of the disordered mind. | |
| III. OFF WITH THEIR CHAINS! | 50 |
| In the midst of the madness of Revolution is born the beginning of a humane attitude toward the madness of men. | |
| IV. A WOMAN BEDEVILS THE POLITICIANS | 91 |
| The persistent determination of an American woman overcomes the indifference of legislatures toward the fight against madness. | |
| V. "QUACK" NUMBER ONE—GALL | 121 |
| A charlatan who claimed to read "bumps" on the skull nevertheless serves the cause of research. | |
| VI. THE ORGANIC APPROACH | 173 |
| Research, gradually uncovering the working of nerves, glands, and brain, begins to strip some of the mystery from madness. | |

CONTENTS

| | |
|---|-----|
| VII. "QUACK" NUMBER Two—MESMER | 214 |
| Once again, a man whose theories and practise have been largely discredited, draws attention to how man's mind can be used to help him. | |
| VIII. MENTAL TREATMENT BEGINS | 260 |
| Hypnosis is developed as an aid in treating the mentally sick. | |
| IX. THE MODERN ERA BEGINS | 287 |
| Freud and the modern psychologists evolve new means of mental treatment. Insanity is curbed. | |
| INDEX | 337 |

LIST OF ILLUSTRATIONS

Frontispiece Pinel casting off the shackles of the insane

| Plate | | Facing Page |
|-------|--|-------------|
| I | The earliest psychiatrist | 2 |
| II | Trephined skulls | 4 |
| III | The early anatomical professor held an intellectually and physically elevated position | 18 |
| IV | Early anatomical diagram | 23 |
| V | Leonardo da Vinci's drawing of the skull | 25 |
| VI | An X-ray showing the ventricles (dark areas) of the brain | 26 |
| VII | Paracelsus at the age of twenty-one | 30 |
| VIII | One of the illustrations from Vesalius' <i>Fabrika</i> . | 34 |
| IX | Apoplexy | 40 |
| X | Early drawing of a reflex | 42 |
| XI | The base of the brain | 49 |
| XII | Modern photograph of the base of the brain . . | 40 |
| XIII | Modern photograph of the front court of the Salpêtrière | 54 |
| XIV | Pinel as a young man | 58 |
| XV | A modern photograph of the gate of the Bicêtre | 60 |
| XVI | Statue of Pinel in front of the gate-house of the Salpêtrière | 68 |
| XVII | Pinel in his later years | 72 |

LIST OF ILLUSTRATIONS

| <i>Plate</i> | | <i>Facing Page</i> |
|--------------|--|--------------------|
| XVIII | Portrait of John Conolly | 74 |
| XIX | Bedlam | 76 |
| XX | Medical treatment in a mental hospital | 84 |
| XXI | Dorothea Dix | 91 |
| XXII | The Trenton State Hospital | 104 |
| XXIII | One of Gall's phrenological plates. | 122 |
| XXIV | A pigeon with the cerebrum removed. | 142 |
| XXV | Marshall Hall | 150 |
| XXVI | Claude Bernard. | 158 |
| XXVII | Brown-Séquard's syndrome | 167 |
| XXVIII | Julius Wagner von Jauregg | 208 |
| XXIX | A mesmeric seance. | 234 |
| XXX | Ambrose Auguste Liébeault | 264 |
| XXXI | Caricature of Charcot | 278 |
| XXXII | Hysterical paralysis | 280 |
| XXXIII | Hypnotic demonstration | 282 |
| XXXIV | The medical faculty at Paris | 286 |
| XXXV | Types of insanity seen through 19th Century eyes | 290 |
| XXXVI | Types of mental patients as seen in a modern occupational therapy ward | 292 |
| XXXVII | Wilhelm Griesinger. | 292 |
| XXXVIII | Emil Kraepelin | 298 |
| XXXIX | Sigmund Freud | 316 |
| XL | Rug weaving in modern occupational therapy | 320 |
| XLI | Recreation for mental patients | 320 |

FOREWORD

No one should be surprised if, at the end of the next twenty-five years, more than half of the mentally sick persons admitted to our hospitals would be discharged as cured.

This statement may seem unbelievable to those who still think that an insane person's death warrant is signed when he is admitted into a hospital for mental disorders—that even if he lives, he will be abused and will never regain his liberty. Yet the same type of cases which, at the turn of the present century, were considered incurable, are even today being treated with so much success that many institutions are discharging as many as twenty-five percent of their erstwhile hopeless patients as sufficiently well to care for themselves and even to earn their own livelihoods.

Another bizarre notion which is currently popular is that psychiatry is a new and mysterious art practiced by men who themselves are eccentric. Perhaps in some instances psychiatrists seem a little weird but probably as a group they are fairly typical of any assortment of highly-trained intellectuals who must pioneer in their field as well as make a living for themselves. Psychiatrists are primarily physicians—physicians who specialize in diseases involving the mind rather than the body. But to paraphrase the old saying, it takes a sound body to sustain a sound mind and bodily ailments do cause mental symptoms.

The practice of mental medicine is by no means new, and

FOREWORD

the lives of great men whose work has culminated in achievements justifying the prediction that the door now seems opening to the cure of all of the insane and the adjustment of most personality problems, make interesting and informative reading.

When Dickens wrote his "A Child's history of England," history books were collections of data about battles and edicts, classified according to dates. From his understanding of literary craftsmanship, he realized that dry historical facts were not palatable for the child reader. Instead of listing dates he described by means of anecdote the personalities of the individuals who made history. Today almost all histories are intended to amuse and edify, rather than to embalm facts, and so deal with the personalities of the actors in history and the behavior which enabled them to achieve importance.

For a period of ten years I have been collecting information about historical characters who were insane and about scientists who made contributions to psychological medicine and its allied medical sciences. It occurred to me that I might be able to select some of this material and, in a systematic fashion, present some idea of the growth of this very progressive and very important medical discipline to those who might be interested. There is a tremendous mass of material to be drawn from in the history of mental medicine so I decided to report upon only the most important contributors and, by describing a little of their lives and adventures, give the reader some idea of how the understanding of man's mind and the means of treating mental disease developed concurrently with the growth of medicine as a whole.

I make no excuse for leaving out some of the details. In fact, I am sure that the reader will have a feeling akin to that of the inebriated gentleman who, on the corner of 42nd Street and Broadway in New York, asked the policeman where he was.

FOREWORD

"Times Square," the policeman informed him.

"Never mind the details," was the intoxicated gentleman's reply. "What city am I in?"

The earlier parts of this history are somewhat fragmentary and the conversations up to the beginning of the Nineteenth Century are largely reconstructions from contemporary writings. I have in other places taken some liberties with quotations and conversations in order to make them a little more readable. My principal objective, besides showing how madness has been fought, has been to show how human the researchers were and against what vicissitudes they had to struggle.

I have not attempted to show the great progress in the branches of mental medicine not having to do with insanity, such as psychiatric child guidance or psychiatric criminology. On the other hand, I have drawn—from some not-too-strictly psychological sources—historical material dealing with anatomy, physiology and nervous disease studies to clarify the steps leading to significant discoveries in the struggle against insanity. The vast amount of collateral material which has been built up by researches in non-medical psychology has, of necessity, been touched upon here only when it has been used in the fight for the restoration of the patients' mental health. I have not confined myself to madness in its more conventional aspects, for I feel that, since the mental diseases involving compulsions, anxieties and paralyses are going to constitute more and more of our hospital population, they deserve consideration.

The fight against madness has proceeded through four steps. First, the ancients had need to recognize the fact that illnesses of the mind were ailments which could be studied. The early analysis of disordered mentality was aided by the work of great anatomists, including the genius, Leonardo da Vinci. The next step, logical of course, was to treat the insane

FOREWORD

as patients. I shall show by the stories of Conolly, Pinel and Miss Dix, how progress was made in this direction.

The next two steps were taken simultaneously, for with refinement of medical methods it was natural that the study of mental diseases should split into two paths. One, taken by Gall, Claude Bernard, Hughlings Jackson and the others who studied bodily function with relation to the mind, culminated in the stupendous contribution of Wagner-Jauregg, whose discovery of a treatment of a dread mental malady now enables many patients, formerly doomed to death, to resume their places in society. The other pathway was that down which science was led by Mesmer, Braid, Bernheim and Freud, whereby diseases of obscure origin—those without any apparent disruption of bodily or brain function—could be treated by psychological rather than by medical means.

It is my hope that this volume dealing with the lives of these great, yet too often obscure, contributors to human welfare and civilization may enable the reader to have a better understanding of how mental diseases are at last being brought under control by medical science.

LOWELL S. SELLING

The Psychopathic Clinic
of the Recorder's Court,
Detroit, Michigan

AT DAWNING

NEAR the River Seine, about forty miles from where Paris now stands, there lived, some sixty thousand years ago, a caveman with his wife and two children. It was his daily custom to leave his cave early in the morning, shortly after sunrise, equipped with a rather sharp stone hatchet and a sharpened bit of flint. He spent the day stalking his prey and in the evening he brought it home to be roasted on a spit and shared with other members of his tribe. One day there was a dispute as to the proper distribution of some musk-ox meat between him and another member of the tribe who had a keen desire to eat the prehistoric equivalent of filet mignon. An altercation ensued and the first man was hit over the head with a stone axe.

His rival found an opportunity to bring his axe up from the ankle, around and down in a powerful swing, following through with a seriousness of purpose which would make a modern home-run-hitter envious. Such a blow would probably cause death today, and it did fracture the caveman's skull, but he did not die.

He had headaches; he seemed bewildered; and in those days when lack of brilliance was probably none too easily recognized, he appeared to members of his family who were dependent upon his hunting powers for food as being somewhat dilatory in his attention to his duties as head of the house. Occasionally he became decidedly bewildered, and his wife noted

MEN AGAINST MADNESS

the fact that he would fail to recognize her; that his usual affectionate approaches which manifested themselves by seizing her hair and fondly dragging her around were fewer and farther between, and that he behaved at times in a manner distinctly melancholic.

Through generations the idea had dawned on the cavemen that there was a spirit of the winds, another spirit which was responsible for rain, and others which determined the forces of nature, and that among these spirits there were evil ones responsible for ugly moods and lack of responsibility in obtaining food for the tribe.

Presently a Shaman, or medicine man, was sent for. While there is no record of how this priest and physician looked, we may judge, by the appearance of the witch doctors who have been observed in present-day primitive tribes by modern anthropologists, that he appeared in a weird costume, perhaps wearing the skin of a buffalo with the horns pecking out over his ears. His face was painted and he had a leg-bone of an ox projecting through his nose. He wore necklaces of animals' teeth and in other ways was dressed up fit to kill—and kill he very often did.

Primitive cause and effect were the most important diagnostic concepts possessed by the witch doctor and the causes were, naturally, quite weird. Evil spirits of one sort or another were definitely responsible for disease.

Confronting the witch doctor in the present instance was a patient who was definitely down-hearted, who couldn't concentrate on the business of acquiring enough food-stuff to sustain himself and his family, and whose family wanted something done about it. This witch doctor, so far as we know, was the earliest psychiatrist, for he had a technique for curing the mental affliction of this injured individual.

The skull fracture caused "fits" as well as melancholy, a



Plate I

THE EARLIEST PSYCHIATRIST

This drawing, by a modern artist, gives an idea of the trephining operation.

From Roy L. Moodie's *Paleopathology*, drawn by Tom Jones. University of Illinois Press.

AT DAWNING

condition which we today call traumatic epilepsy. The patient would be walking about the cave and would suddenly collapse, stiffen out, shake, and froth at the mouth. Occasionally, when he fell down, only one side would be affected; his fingers might begin to twitch, the arm to move and the whole rest of the side in a progressive order showed the effect of the injury to his brain. But his mind, too, was affected. Something had to be done about it.

The Shaman called for two husky assistants who seized the patient and put him down so that an operation could be performed on his head. If we may judge by the absence of sensitivity to pain which is noted in primitive tribes of our own day, it was not always necessary to hold him down. Even without an anesthetic, he was so dull, stupid and miserable that he sometimes offered no resistance. At any rate, he was lowered into a prone position and his head was seized between the knees of the Shaman. From a pocketlike tuck in his garment the Shaman pulled out a few leaves of coca which he stuck into his mouth and commenced to chew. He then quickly picked up an extremely sharp-edged stone, one which had almost a saw-tooth edge where tiny chips had been knocked away, and drew it quickly down through the middle of the scalp, exposing the skull. At that point he may have used various techniques which we know were practiced time and again on primitive man.

He either found a small stone with a sharp, small, spoon-like edge with which he chipped away the skull in the form of a circle; or he found a smooth, knifelike, very sharp stone which he drew around one area of the skull in a circle again and again until the skull was cut through. Whichever means he used, he made an opening, which we now call a trephine, which "allowed the devil to escape" and incidentally relieved a certain amount of mechanical pressure on the brain.

MEN AGAINST MADNESS

It is surprising that these primitive men should have had enough sense to suspect that the brain was involved in cases of melancholia or convulsions, because even enlightened peoples like the Greeks did not. It is quite likely that, through their observation of many cases, they came to the conclusion that when the head was injured incompetence or fits followed; and they probably arrived at the idea that devils were involved because the symptoms disappeared when the skull was opened to let them out. Since the devils, of course, were invisible they could escape without being seen.

Many trephined skulls of primitive men and women have been found. Some of them show healing around the trephine opening, indicating that the scalp was later closed up and that the individual lived for many years after the operation. It is probable that the prehistoric surgeon stuffed the chewed coca leaves into the wound to ease the pain, and the caveman had a great deal of resistance to infection, so that he survived, whereas today a civilized man would undoubtedly die.

It is interesting to note that most of the skulls which have been observed in various places where trephining was carried out by primitive people belonged to women. Either in the early days of the race women were more subject to headaches, convulsions and insane behavior than men, or they were easier to operate upon. It would seem, nevertheless, reasonable to assume that the first operations were performed on men, because only from the experience of seeing the results of an injury to the man's skull, could the priest come to the conclusion that the seat of the intellect, or the seat of the motor control of the body, lay in the brain.

In the light of the fact that modern psychiatry is little more than one hundred years old, it is interesting to note that the earliest "psychiatry" of which we have any knowledge whatsoever was manifested in the life of the caveman.



Plate II

TREPHINED SKULLS

The upper two skulls show the methods of cutting into the skull by cross-scraping. The middle and lower two skulls show healing of trephined skulls . . . the patient lived!

From Roy L. Moodie's *Antiquity of Disease*, University of Chicago Press.
"E" is after Muniz and McGee, *Primitive Trephining in Peru*,
Smithsonian Report, Washington, 1894-95.

AT DAWNING

About sixty years after the death of Christ a hypothetical oman citizen, Sextus, had a sick slave. Slaves were particularly valuable possessions and Sextus had no intention of losing his one. He had an idea that perhaps this slave had "the flux," * and he intended that something should be done about it. So he beat him. In spite of all that Sextus could do, the slave would live, talk continuously, and walk up and down through the house. He would fail to answer questions and in every way seemed to be most silly.

Sextus called to his wife and asked her what he should do. She answered him, "There is a doctor down the street, a Greek. His name is Areteus. All the women in the neighborhood like him. He is jolly, and, while nobody would call him handsome, he seems to get some remarkable results in treating slaves."

Mrs. Sextus was quite right in her description of Areteus. From the records which we have of him he must undoubtedly have been a jolly sort of fellow. He was not at all averse to illustrating his clinical ideas with a good story, and he seemed to have some pretty clever notions about medicine.

Sextus went down the street and brought Areteus back with him. "I am afraid," said Areteus, after examining the slave, "that you have a case of madness on your hands. Of course, you know, that madness is due to the fact that you or that slave of yours has aroused the displeasure of a God."

So he questioned Sextus. First he asked whether, by some chance, Juno had been displeased, because it was common knowledge that any displeasure of Juno would cause madness. Then he went down through a list of all the Deities, until finally he came to the Wood Nymphs. There was nothing that Sextus could think of in his own behavior or that of his slave which would justify calling down the contempt even of such mildly

* An ancient disease which has no modern counterpart, probably a diagnostic wastebasket.

MEN AGAINST MADNESS

potent deities as the Wood Nymphs. So Areteus scratched his head, but being a good doctor he was not at a loss.

"Well," he remarked, "regardless of what deity you have displeased, something will have to be done about it. Since the law says that if I treat this man and he dies I shall have to pay you, I would like to make a thorough study of him."

So he made quite a searching investigation of the slave.

"You know, Sextus," he said, "that I have been pointing out around this town the fact that there are two kinds of madness, mild and severe. Now those who have mild madness are able to go to the market place and are harmless. You've seen them. But the excited kind, the maniac, I think we ought to keep locked up. Of course, your slave has only been sick for a day or two, but it would be well if you would keep him here in the house and not let him out. If he keeps on being so excitable and so destructive, perhaps we will have to tie him to a bed or into a chair."

"What do you think caused this illness, Areteus?" Sextus asked.

Areteus pondered.

"Undoubtedly some god has been displeased," he said. "Unfortunately, since the man doesn't seem to be able to give me sensible answers, I don't know. Most likely Juno, because her displeasure seems to be most annoying. You know, the head is the seat of reason, and Juno is the Goddess of Reason. His head is surely decayed."

Sextus looked somewhat startled.

"Areteus," he replied, "that doesn't seem to be the idea of most of our local doctors. They seem to think that the heart is the seat of the soul, and therefore, it, of course, is the seat of reason."

Areteus, like some modern doctors, was not averse to boasting.

AT DAWNING

"Well, after all," was Areteus' answer, "you know most of the local men just picked up their knowledge. Of course, some of our leading citizens, like Aurelius and Julius, have very highly trained slaves to take care of the medical needs of their households, and there are a number of excellent Greek physicians, but, after all, I was trained in Alexandria, and there they still maintain that the old Hippocratic doctor is the best. Hippocrates, I think, was quite sensible when he said that the brain is the seat of reason. He differs from Aristotle and others, and even our modern physicians.

"As you know, he believed that there were several kinds of temperaments: those in which there were too much of one of the 'humors' had symptoms depending on which humor was in excess. There is the biliary or peevish personality due to an excess of yellow bile. The choleric or violent kind, which is due to black bile, and when the body fluids mixed up wrong we got insanity. Aristotle, you know, thought that man was just composed of fire, air and water; and when these things were mixed up we got madness. Hippocrates' idea of natural causes of insanity, to me, seems to be pretty smart. He says, for instance, that bile gets into the brain by way of the veins, and it heats the brain and produces restlessness, noisiness or mania. Phlegm, on the other hand, cools the brain and produces sorrow and anxiety. As for me, I will stick to Hippocrates."

Sextus thought for a moment, and then he spoke: "Well, of course, I knew that you Alexandrian physicians had that idea, and if you can cure the slave it suits me fine. I did hear, though, that this man Hippocrates that you talk about so much really did not do a great deal."

"Well, as a matter of fact," said Areteus, "some of the men at Alexandria thought that perhaps the writings that we study there are compilations of the work of different people. The fact that Hippocrates has been so much deified convinces me

MEN AGAINST MADNESS

that there is a certain amount of myth about the details of his existence. But after all, the rules that he lays down for treatment convince me that they are excellent."

Sextus asked him "What are you going to do about treating this man?"

"We must keep him quiet," Areteus said. "No music. Warm baths should help. I know that Asclepiades, who takes care of a number of families, differs with me. He always says, 'Give them music and smelling salts.' But I say, 'Put them to sleep. Put them in a dark room. Take away all the noise. Lots of rest. Good food, but not too much. And a little bit of blood thinning produces results.' I am against the excessive blood letting of some of the other men around town, because I think they thicken the blood so much by letting a lot out that when it gets to the brain it clogs it up. So let's put him to sleep, have him kept quiet, and I am sure that he will get better soon."

Areteus was quite a thinker. He followed a long line of physicians whose present-day records are practically all fragmentary, and whose ideas on the subject of psychiatry were pretty far-fetched. But it is surprising how modern Areteus was compared with some of his confrères.

He was a very good observer. He was able to note, for instance (as shown by his writings which have come down to us) the fact that a man who is emasculated loses his masculine prerogatives. No longer does he have hair on his chest and on his arms. His voice becomes squeaky, and he becomes quite effeminate. And Areteus rightly ascribes his masculinity to the possession of the sex glands. This seems to have been more or less ignored for many centuries later.

Areteus' attitude toward madmen was one of common sense. But the attitude of the general public of both Greece and Rome probably was not. Madmen, particularly those who had foolish

AT DAWNING

ideas about religion, who claimed—because of their mental disease—to have communion with the gods, were very often treated as god-like persons and were thought to have divinity. Others, on the other hand, were ridiculed and were allowed to become the butt of the jeers of unthinking children. As the polytheistic religion of Rome lost its influence, the attitude toward the madman lost some of the respectfulness that we noticed earlier, and in the time of the last of the Empire a madman was considered a thing of evil omen, and sane persons were supposed to spit on him in order to ward off the evil that he could do.

Except for the story of the confinement of Cassandra in the tower when she made her prophecies, there is no evidence that there were any institutions or other places in which to lock up people who were out of their minds.

But madness in some form is found mentioned in all the Grecian literature, and there was some recognition of the fact, of course, that madmen were extremely dangerous.

Plato and some of the other early philosophers and observers recognized the fact that has been recently pointed out by Freud, that love is an extremely common cause of madness. Excessive eating and drinking, Plato thought, might be another. Some of the early Greek physicians recommended a light diet for certain types of madness, particularly those where there was excitement; and, in those cases where the patient was calm and very much depressed, many physicians felt that some feeding should be encouraged. Hippocrates in a primitive way urged the use of bathing and sunlight and many other fore-runners of the modern treatments which we are now using in our mental hospitals.

But beyond all, there was no recognition of why there was such a thing as madness. The reason was, of course, that there

MEN AGAINST MADNESS

was no anatomical knowledge, and no scientific psychological knowledge upon which these early peoples could base their opinions.

Areteus was a smart man, however. While Hippocrates recommended warm baths, fresh air and other things to make people sleep, Areteus had, in addition, a very practical idea. He recommended rubbing with oil, patting the head, stroking the temples. Also, he drew the analogy that by patting the heads of wild beasts and stroking their temples we soothe them.

"Why," asked Areteus, "could we not then soothe the disturbed person who could not sleep?" He also emphasized that a strange location of the bed was the cause of poor sleeping, for he said, "Whatever is familiar to anyone is to him provocative of sleep. Thus can the sailor repose on the boat being carried about on the sea, soothed by the sound of the beach, the murmur of the waves, the boom of the wind, the sun on the sea and the ship. But to the musician the notes of the flute or playing on the harp or lyre, or the exercises of musical children are more soothing."

And he again emphasized, with a rather humorous little story, his idea of melancholy, telling about a man who thought that he was incurably affected with melancholy, and who finally fell in love with a girl. Up to that point, relatives called in all sorts of physicians, who could bring him no relief from this melancholy. But finally, when love came to him he was cured. It was Areteus' idea that when this young man was courting the girl and she wouldn't accept him he was down in the dumps, for he says: "The man was dejected and spiritless from being unsuccessful with the girl, and appeared to the common people to be melancholy. He did not know that it was love, but when he imparted the love to the girl he re-

AT DAWNING

covered from his dejection and dispelled his passion in sorrow, and, with joy, he awoke to the happiness of mutual love."

But the poor physician in the town of the Greeks was worried about the treatment of madness. He saw many cases that he could not control. Playing music, keeping the patient quiet, giving medicine, blood letting, all the means at his disposal often failed to cure or even to improve. He was at the very dawn of mental healing. Because he had no knowledge of scientific medicine, he had to practice by trial and error, and had to draw analogies from his own thinking. In fact, two rather important physicians recommended flogging the insane. So far as the feeble-minded were concerned, no distinction was really drawn between them and the insane. They were, however, the butt of jokes. Because they were so simple, people would tease them even as the thoughtless do today, when we get a lot of amusement out of fooling stupid persons. The idiots who roamed the various Grecian and Roman towns were the delight of the population.

Of course, medicines were suggested, the liver of a vulture cooked in blood and administered in honey, to be taken for three weeks; or "the heart of a vulture dried and taken in water." Someone else suggested rubbing the glands of the neck with the blood of a weasel; but another apothecary was even smarter than that, and carried the idea a little bit further, suggesting that the weasel be boiled, and that everything be eaten except the feet and the head. A physician perhaps a little more brilliant concluded that it wasn't necessary to eat the whole of the weasel, but that perhaps the weasel's liver would do, merely dissolved in water. The suggestion of one doctor about drinking the blood of an amphibious tortoise does not seem particularly appetizing today. And as for burning the hoof of an ass, and taking two spoonfuls of the residue, this

MEN AGAINST MADNESS

seems to be a lot more tempting than the idea of putting the gall of a sea tortoise up the nostrils.

Areteus was probably a pharmacist, and he would have had no hesitation in making up some of the prescriptions listed above, except that we do find that he said that in the treatment of epilepsy some people suggested the liver of a vulture, but that to him the idea did not seem very good.

Areteus and Asclepiades had a little difficulty, too, not only about the use of music, which Asclepiades recommended, and which Areteus didn't like particularly, but about the use of dark rooms. Asclepiades thought that putting a man in a dark room would make his hallucinations more vivid.

These three men, Areteus, Hippocrates and Asclepiades, all had rather brilliant ideas about insanity, even to the extent that Areteus classified the mental diseases as mania and melancholia, paranoia, epilepsy and other conditions, a classification similar to that in use almost until today, although he did not use the same terms.

Following them we find a dead period. Galen, whose writings were considering a model for generations—perhaps for a thousand years after he had died—helped and at the same time hindered a development of an understanding of mental disease.

Shortly after the death of Areteus we have an example of how the meddling layman can interfere with the development of medicine, for a noted theologian, Tertullian, who was a historian of sorts, wrote, among other controversial papers, a blasting article criticizing two Alexandrians, Herophilus and Arasistratus. These two men undoubtedly were teachers of Areteus. They were far advanced in thought for their age, and were high-class physicians. The thing that bothered Tertullian was the fact that Herophilus and Arasistratus were supposed to have experimented on live human individuals, probably condemned criminals; and Tertullian, having a religious slant,

AT DAWNING

was unable to visualize the potential scientific value of this work. He became very much disturbed.

His excitement was not justified. First of all, Galen, who is undoubtedly the most significant writer among the Greeks, would have mentioned it if these men had really performed such an experiment. Secondly, the layman often gets unduly excited when the physician performs unusual experiments. What could Tertullian know about the need for such experimentation, since, after all, he was not medically trained?

Be that as it may, if these two old Alexandrians were fortunate enough to have had a chance to operate on a few live individuals and learn something about the physiology of their brains, more power to them. It is only too bad that a record of their work has not come down to us. Nevertheless, we do know something about what Herophilus did. His records are about the first that we have to indicate that he used his eyes when he opened up the skull cap.

Even a bright child nowadays has a pretty good idea of what is inside of the skull. He knows that there is a mass of material, wavy in its general form, which forms the big brain, or what we who like our long words call the cerebrum. The child undoubtedly does *not* know that lying underneath is a little brain with two lobes and a device in the middle—more or less like the differential in the rear axle of an automobile—which holds the two lobes together, and which is called the cerebellum. This is at the base of the brain in the back, and, as I have said, it lies beneath the cerebrum.

Holding the cerebrum and the cerebellum very closely together is the beginning of the brain stem which connects with the spinal cord, a mass of material rather like a number of soft strings tightly bound together, which lines the inside of our bony spinal column. Covering the brain is a thin coating almost like gossamer. It can be seen, but it is certainly as fine as

MEN AGAINST MADNESS

the finest of linen handkerchiefs. Outside of it is a tough sort of canvas-like covering. The inner covering we call the *pia mater*, the outer cover the *dura mater*, *pia* meaning soft, and *dura* meaning hard. *Mater* of course means mother, and it has another meaning, viz., a covering or protection. Between the two is a spider-web-like material, and there also is fluid (the cerebro-spinal fluid) to act as a cushion, so that if a blow or buffet strikes the skull the brain will be protected between these two membranes.

Herophilus saw these membranes and reported on them. He also noted that in the brain there were blood vessels that followed a very definite shape; that the brain had a rich supply of fresh blood; that there were huge vein-like structures, which we call sinuses, to draw the blood together, discharge it into the large veins, and return it to the heart and lungs, where the blood later on becomes re-oxygenated, thus taking oxygen to other parts of the body. Now these sinuses are not the same ones that give people a pain in the head when they live in bad climates; the word *sinus* merely means a kind of gap or open place, and is used to describe a number of organs through the body. The sinuses of the brain are folds in the covering, particularly the *dura mater*, which permit of the withdrawal of the used blood, from which the oxygen has been taken, into the vessels so as to be returned to the heart for another load. Among the sinuses is one particular structure which still bears Herophilus' name, and we can be thankful to this old gentleman, whether he experimented on criminals or not, for first bringing these structures to our attention.

Men began at last to have some sort of idea of what the brain looks like, and that it does have coverings, and that it is not just a shapeless mass of material containing something that might be called "spirits." And some thanks to Tertullian for

AT DAWNING

attracting attention to it, because he gave us a chance to remember that we owe a debt to Herophilus.

And now we come to Galen. Galen was a pharmacist and a physician, very much as Areteus was, but Galen was not as fortunate as Herophilus, as he did not have a chance to operate on human bodies. Somehow or other, possibly owing to the influence of the beginning of the Christian era, people looked with a certain amount of disgust and superstitious fear on the idea of operating on even the dead human body. To some extent this is still true, but our enlightened public today understands the need for actual study of the human body. Galen was forced to operate on pigs and other animals, including the ape, and he wrote a textbook of anatomy which stood for generations through the Dark Ages as the great authority upon the construction of the human body. It is fortunate that, so early in the history of civilization, experimenters realized that there was some resemblance between man and the animals. In those early days no one was willing to admit that the mind of the animal might have some resemblance to the mind of man, but Galen did show resemblances between the organs of the animal body and those of the human.

Had it not been for Galen, it seems quite probable that scientific medicine of all sorts would have disappeared under the prejudiced stupidity of the so-called thinkers who lived in the first thousand years of the present era. It seems that every theologian had an idea of his own about how the body was formed and how it worked, but nobody had enough sense actually to verify by observation whether his theories about the functions of the body had any justification in nature.

Galen was, if nothing else, an observer. He was quite a theorist, also, and had an interesting style or manner of expression. In addition, he was rather a shrewd politician. He was

MEN AGAINST MADNESS

very closely attached to his father, who chose medicine for him because he had a dream indicating that the son should follow this profession. So Galen was properly educated to be a physician, migrated to Rome, and there took care of the Emperor Marcus Aurelius. The plague broke out in Rome, and somehow or other Galen was able to join the army in the field, thus escaping any likelihood that he would catch the terrible disease itself. Although he was called back to Rome by Marcus Aurelius during that dread time, he remained with the troops to take care of the Emperor's son, little Commodus. If one were to weigh the good that Galen's work did for humanity in the centuries which followed, and the harm which his efforts indirectly accomplished in saving Commodus' life, there is a good chance that the latter would outweigh the former. He very shrewdly was able to avoid "risking his own neck," and at the same time wrote his splendid works about the human body.

Galen thought that the air was absorbed into the body, and that there were all sorts of spirits, natural and animal, which were evolved by various organs, and which were responsible for life. The significance of such a theory nowadays, of course, is nil. It has only a sort of museum value for us, as showing us how bizarre the theories of the ancients were about the human body. Galen observed the brain in lower animals. He did recognize that the brain was connected with other parts of the body, particularly with those closely associated with the senses, by means of cordlike nerves. He did not know, of course, that there was an olfactory nerve which extends from the nose to the brain, and which is responsible for our being able to smell, but he did recognize that there were certain nerves that extend from the eye, ear and tongue, into the brain, and which, according to his theory, being full of animal spirits having to do with life, or intelligence, or what-not, enabled one to do some thinking and observing. He concluded that nerves are hollow

AT DAWNING

tubes which permitted the animal spirit to float hither and yon thus accomplishing its purpose of giving the human being mentality. Galen adopted many of the opinions of Hippocrates about mental disease, but, because of his prejudice about animal spirits and his lack of knowledge and ability to do much thinking along original lines, he made no very great contribution to the field of mental disease. On the other hand, he did not do any harm, either, a fact that is decidedly in his favor.

When one considers the great number of philosophers who have had some theory about madness and the way the mind works, and how much one or another of them has steered us away from the right track, we can at least be grateful to Galen for doing nothing. But because, at least in the early days of the development of mental medicine, a knowledge of brain function and the physiology of the nervous system was so important, we must be grateful to him, also, for operating on his dogs and monkeys to see how their brains were constructed.

MADNESS IS IN THE BRAIN

FROM the standpoint of mental medicine the Dark Ages were very dark indeed. The nations were so busy fighting wars that they had no time to do anything more about studying the mind than trying to carry on a little practical politics; and practical politics are scarcely in the realm of science. It was not until about the twelfth century that we see any real signs of a development of knowledge about the physical structure which lies behind human mentality. It is only natural that, under the great Italian dukes, at Venice, Bologna and Milan, who encouraged discovery to the maximum degree, there should be a new growth of interest in science from the standpoint of the human body. Because of the encouragement given to art—particularly art of a religious sort—and paintings of the human body to resemble local celebrities, an interest in anatomy was soon developed.

No prince wanted to have his picture painted in caricature. He wanted to look like a celebrity, and no mistake about it. Certainly the early painters who took the liberty of reproducing the features of the leaders of the Venetian state, were quickly disillusioned if they tried to sell or present a picture which would not please the patriciate. The subject was usually none too pretty, and from the accounts of the visages of such individuals as the Bolognese, Cesare Borgia, we are led to believe that pimples and other blemishes were not uncommon. So

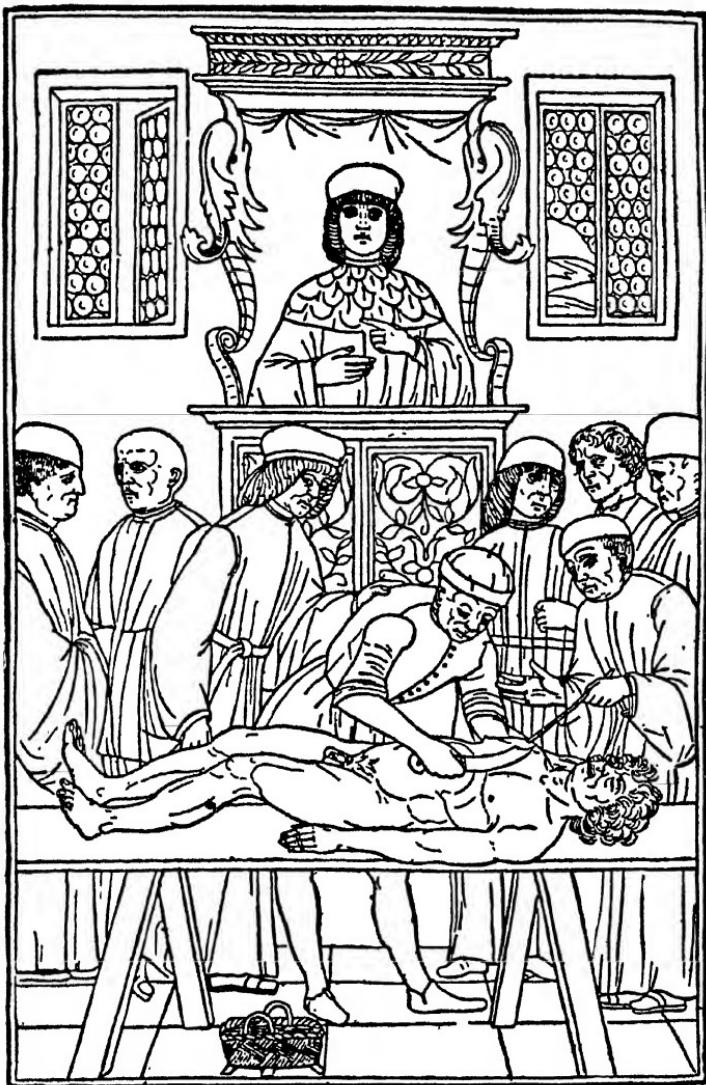


Plate III

THE EARLY ANATOMICAL PROFESSOR HELD AN INTELLECTUALLY AND PHYSICALLY ELEVATED POSITION

From an old woodcut.

MEN AGAINST MADNESS

there was no objection to retouching. But a nose had to look like a nose, and not the prow of a Roman galley, and a mouth had to be something human and not a trap-door. Perhaps the leaders of the Italian states were vain, but their vanity by no means compared with the vanity of the women whom the great Italian artists painted. Since many of them were mistresses of the artists, it is easy to visualize the home life of a painter who didn't do justice to his lady friend. The curves had to be there, the well-rounded shape had to be a well-rounded shape, and breasts had to be put where breasts should be, and not some diagrammatic place, as one so easily can find in the earlier paintings. Observation, then, was the theme-song of the day. It was not a far step from a careful investigation of the surface anatomy, to the underlying muscles, bones, joints, and other structures which give to the human body beauty in its characteristic form.

Some time after the beginning of the thirteenth century the dissection of the human body began to be encouraged. There was, of course, a great deal of prejudice against dismembering or otherwise mutilating a cadaver, but this attitude was merely a carry-over from earlier superstitions. There is a record, for instance, of the embalmers in Egypt being stoned for dissecting a body for separation of parts before burial. But in the year 1240 the Emperor Frederick II issued an order that cadavers should be dissected in the presence of physicians and surgeons once every five years. As a matter of fact, he maintained that a course in anatomy should be included in the medical school in Palermo, and that nobody should be permitted to practice surgery until he had studied anatomy for a year.

At the beginning of the fourteenth century a judge in Bologna issued an order that dissection should be performed on a dead body in order to find out the cause of death. This was the basis of the first medico-legal autopsy, and its "descendants" at

MADNESS IS IN THE BRAIN

the present time are the investigations made by coroner's physicians who report causes of death, particularly when there has been a little by-play with knives or revolvers. At last, some of the dread of dissecting the human body had disappeared!

About this time one Mondino, an anatomist, stepped down from the professor's chair. This statement may sound a little bit trite, but it is very significant in the history of the healing art. Because of the fastidiousness or the dignity of the professor of medicine and surgery in the old Italian universities, he sat on a chair on a high canopied platform while he lectured. Beneath him was a table upon which lay the cadaver, and a barber was called in to cut the cadaver into various pieces under the direction of the professor, who would then read his lecture notes. He was at least six feet away—a very sensible precaution to be sure when one realizes that bodies were not embalmed—and in the nice warm healthy climate of Italy the corpse probably made its existence manifest at an even greater distance than six feet. But in the interest of science, Mondino was willing to climb down. Perhaps a stupid barber cut the wrong muscle; perhaps the professor became a little curious to find out what that nodule or that structure was that he could not see from where he was sitting—at any rate he came right down out of his chair on the platform, opened up the cadaver himself, and pointed out the salient features. Some historians have claimed that Mondino was the first great observer after Galen—he himself, in his own writings, does not deny that everything that he described he saw himself. Unfortunately we must question this statement, because some of his descriptions more closely resemble those of Galen than do the actual parts of the human body that he describes.

His predecessors pointed out that there were nerves coming out of the spine, as well as those coming from the brain to the eyes, ears and other sensory organs, and Galen pointed out that

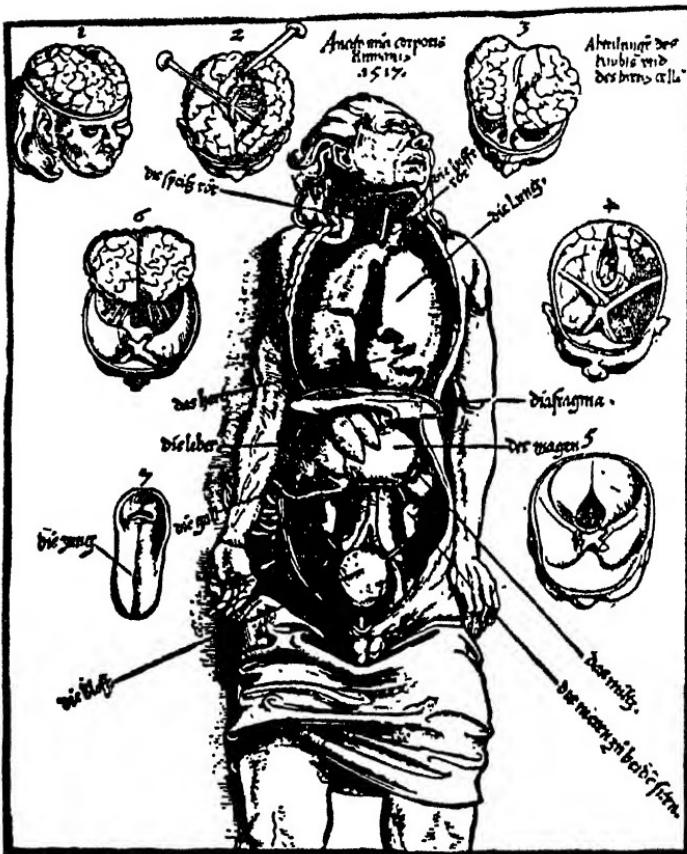


Plate IV

EARLY ANATOMICAL DIAGRAM

The upper inserts, Nos. 1 to 5, show the primitive artist's idea of the brain.

From an old woodcut.

MADNESS IS IN THE BRAIN

these gave the human organism some means of contacting the outside world. Mondino went further than this—in spite of the fact that he made his dissections in considerable haste, because of the decomposition of the body and the fact that people were undoubtedly anxious to bury the cadavers of their relatives as soon as possible, although they were mostly criminals. In other words, although he made a number of errors, nevertheless he seems to have been one of the first to record the fact that, if one cuts the brain open, there are revealed some large winglike structures in the middle of each side of the brain which contain fluid during life. These two run together and make a large, lake-like structure, which in turn ends in another "lake" near the cerebellum. Thus, we have a formation somewhat like the body and claws of a lobster, except that the "claws" are much larger in proportion than they are in the body of a lobster, and the "body" has decidedly a more wasp-like waist. The paired structures (claws) are called the lateral ventricles; the other two, the third and fourth ventricles.

For those of you who have never seen calves' brains neatly broiled and lying on a piece of toast, perhaps it may be hard to give an impression of what one sees when one examines the human nervous system. We now have an idea of something of this sort about the brain. The best description which I can give of the human brain, as one looks at it from above, is that it looks like a sheep's back with the wool neatly parted in the middle and with a number of symmetrical wavy structures rolling out toward the flanks. The two sides of the brain, as well as the two sides of the cerebellum are symmetrical; and in each one of them lies one of these lateral ventricles. The relationship of these ventricles was not particularly obvious to Mondino, for the simple reason that every brain he studied had been somewhat distorted in the removal, for the brain is a very soft structure. He had an idea that these four ventricles were

MEN AGAINST MADNESS

strung out, one after another, very much like a string of beads—at least so his diagrams indicate; but it may just be bad drawing, for all art in his day was only on the verge of development.

Nevertheless, it remained for a young man who was born a few years after Mondino wrote his book to make the first cast of these ventricles so that we could really see that the brain is a symmetrical structure. His name may not be unfamiliar to many of you—he was a young aviation engineer * who, although of illegitimate birth, was adopted by his own father and got along very nicely. He was also known for his description of siege works and military instruments, such as bombards (a forerunner of our sixteen-inch guns), and other death-dealing appliances. His many-sidedness has long been a matter of amazement and one would almost surely recognize whom I mean by the fact that his paintings "Last Supper" and "Mona Lisa" are found reproduced throughout the civilized world. He was, of course, Leonardo da Vinci.

Leonardo was a curious individual. He was somewhat seclusive, had a lot of time to daydream in the hills of his native village, and had considerable money, so that if he did want to take a little time off from work there was nothing to stop him from spending that time in mere thinking. He was quite a favorite of many of the princes, particularly Ludovico Sforza, Duke of Milan, who has been known as Il Moro (The Moor—because of his swarthiness). Leonardo's artistic ability was never very much hidden. Even before the lad's maturity his father recognized the fact that he had distinctive artistic ability, and apprenticed him to one of the Florentine artists in about his eighteenth year. He entered the studio of Verrocchio, who was quite insistent on the fact that his apprentice know the surface musculature of the body as well as possible.

* His is the first known drawing of a real flying machine.

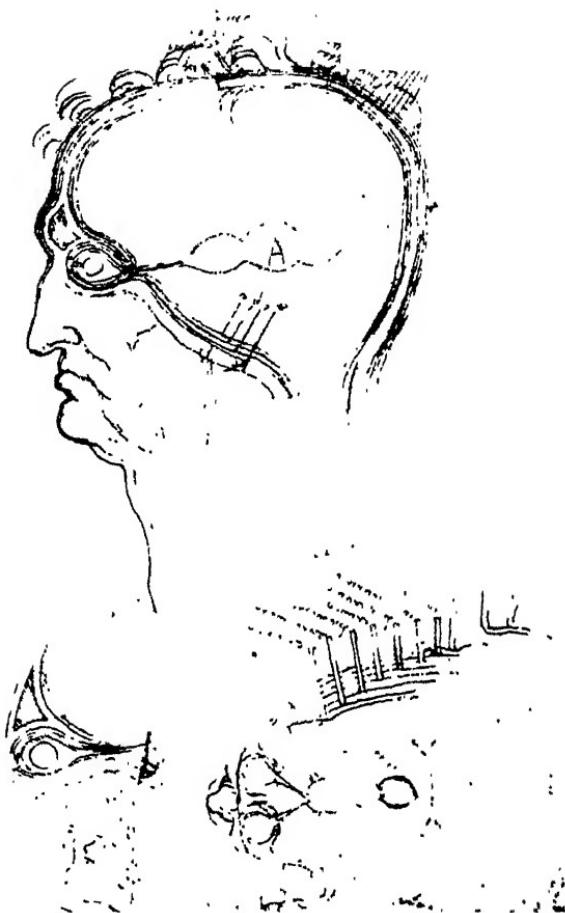


Plate V

LEONARDO DA VINCI'S DRAWING OF A SKULL.
Showing his idea of the shape of the brain and the relationship of
the ventricles which are marked "A" in the illustration.

MADNESS IS IN THE BRAIN

It seems quite likely that, since there were some anatomical lectures being held in Florence at that time, his master made him attend them, and there is no reason not to believe that he had an opportunity of observing the human body properly dissected. He himself states that he "made many anatomies," which he performed in the hospitals of Santa Maria and Nuova, Florence. And his records become particularly soulful in describing a study he made of the body of an old man who had passed away peacefully in his sleep. He thought that, since this old man had had such a peaceful death, it was interesting to see in what a fine state the body happened to be. He mentions only casually that, because of the fact that the old man was emaciated, it was easier to disclose some of the more delicate anatomical structures, which, of course, one cannot do in a more obese body.

But, in spite of the fact that all recognize Leonardo's genius, historians suggest that he was rather a lazy individual. It is open to question whether many of the pictures that we consider his most famous were really finished. He suffered a distinct lowering of his effort from time to time, and there were occasional periods in his life when he dropped out of artistic things more or less to push himself forward politically.

But he was an ambitious man and he made several propositions to Italian rulers that they engage him as a military engineer. Fortunately not too much attention was paid to his claims on this score, or we might have lost some of his greatest contributions to early neurology.

Leonardo, as I mentioned above, was the first one who made a cast of the large "lakes" of the cerebrum. It must have been an extremely difficult thing, because bodies were not embalmed; there was no such idea previous to his time as injecting the blood vessels and cavities with a hardening fluid in order to find out what their natural structure might be. We do, how-

MEN AGAINST MADNESS

ever, have a drawing of his cast, the first on record. There are other splendid drawings of cross-sections of the brain, of various arrangements of nerves throughout the body after they have left the spinal cord and approached the muscles. It must not be forgotten, either, that upon the basis of the life of Leonardo da Vinci, Freud, one of the greatest contributors to psychiatry, made a character analysis which stands out as a dramatic document.

Although medical learning wound its way through centuries largely within the confines of the Italian Peninsula, its effects were felt throughout the civilized world. Padua and Bologna, as well as other Italian university centers attracted students from all over the continent of Europe, and from England and Scotland. Since all of science was in the guess-work stage, it could not be expected that medicine would have progressed ahead of common knowledge.

At the beginning of the sixteenth century the world was still fairly well impressed with the idea that the sun revolved around the earth rather than the reverse. The ideas of science were limited entirely by those beliefs held by the monks and priests, who held learning in their hands, and any exposition of an idea which contradicted the teachings of the theologians was practically a voluntary request that its author be subjected to the stake and fagot.

It is certainly the case even today that when we know very little about something we are not inclined to admit our ignorance. What we lack in the ability to determine the truth, we make up by the fluency of our imaginations. Unfortunately, the truth is determined only by the use of ingenuity and hard work, and by sorting out facts to derive therefrom a conclusion which should be accurate and which should reveal a cause and effect relationship. And when, as in the early days of medicine, facts could not be ascertained, because there were no micro-

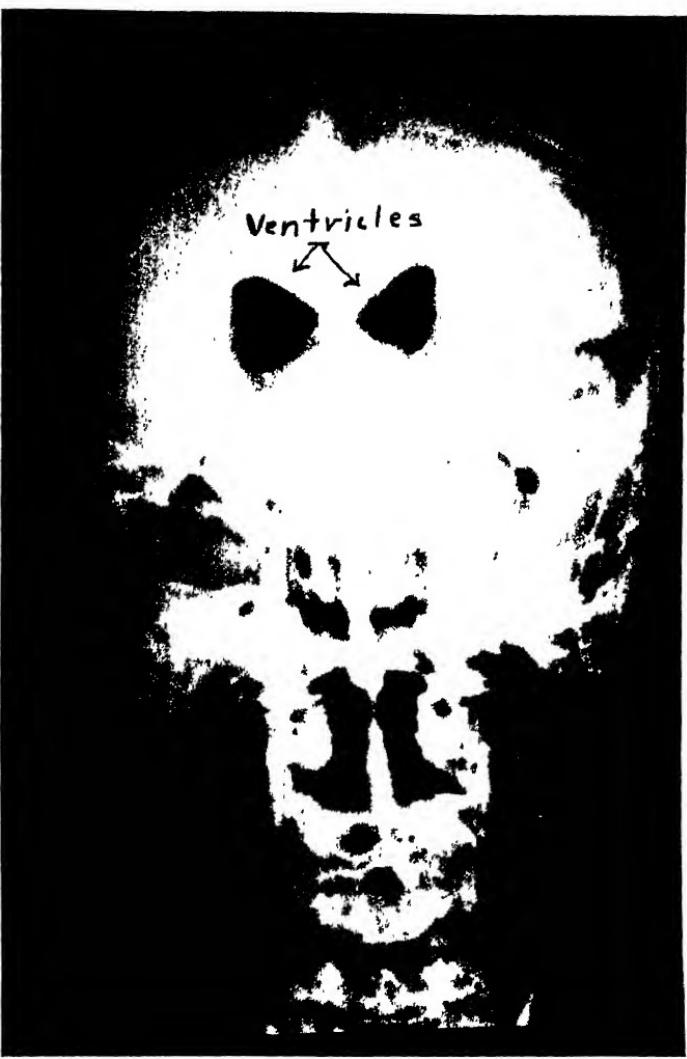


Plate VI

An X-ray showing the ventricles (dark areas) of the brain. Compare with Plate V, Leonardo's idea.

Courtesy of Dr. J. M. Grace, Eloise Hospital.

MADNESS IS IN THE BRAIN

scopes and no delicate scientific equipment, speculation ran rampant.

Fortunately, by the time of Leonardo the anatomists at least had restricted their fact-finding to observation, and were on the verge of eliminating speculation. They were, at last, dissecting the human body and carefully observing the parts as they could be seen. Of course, the dead body is not the same as the live body. When death ensues the body is merely a lump of semi-plastic material, and the fluids seep to the lowest parts. For dissection, the body is lying against the flat table—the part in contact with the table also becomes flat. For those who have not closely observed a dead body I might say that the muscles are tense, that the arms, limbs and legs are stiff, the eyes have a grayish, glassy look, and the whole countenance has a characteristic pallor. Do not be deluded by the pink and healthy color which the corpses of your friends have had when lying in their caskets. This is but a product of the undertaker's art, and a very dainty and much appreciated art it is, for it spares us the grief and the punishment of having to look upon a rather unpleasant and discouraging human cadaver. But certain "facts" are in that body, needing only to be ferreted out.

The anatomists, therefore, in the period we are discussing, were adhering as far as possible to fact. They were describing the brain and the spinal cord, the heart and the lungs, and the bones and the muscles in an accurate manner. Where they made mistakes, they made them because they were working on dead bodies, not live ones, and occasionally they checked what they found in these dead human bodies against what they found in the live bodies of animals. But vivisection was not yet very much in vogue, and discrimination between the differences in a lower animal and the same part in the human was not carefully carried out.

MEN AGAINST MADNESS

Contemporary with Leonardo da Vinci, there lived in Switzerland a man with the euphonious name of Phillipus Aureolus Theophrastus Paracelsus Bombastus Von Hohenheim, whose nickname was Paracelsus. In spite of the adage that the good die young, Paracelsus lived to be only about forty-eight, but during his brief tenure of life he caused plenty of disturbance. It is hard to determine whether in those days a person could actually be a quack. Certainly Paracelsus enjoyed advertising himself, being dramatic, and attracting patients whom he did require to pay huge fees. On the other hand, if he was a quack, he was one of the few quacks who really made a contribution to the development of mental healing.

In antiquity, during the Dark Ages at least, insanity was considered the result of some evil deed on the part of the sufferer. The Gods were bringing down upon him their wrath. But during the Middle Ages the madman with delusions, particularly those in which he thought himself to be an angel or inspired by God was often looked upon as a saintly person, although other lunatics were thought of as dangerous individuals who were devil-infested. Whether Paracelsus thought it would attract patients if he contradicted current beliefs, or whether he actually believed that madness was due not to any divine influence, but rather to the imperfect mixture of salts in the body, he made that claim most emphatically. The placing of Paracelsus among the quacks is due undoubtedly to the fact that he stepped off the beaten trail. Those who believed that Galen was the important physician in his day, had their toes trodden on in no light fashion when Paracelsus began acquiring fame.

Paracelsus' part in medicine is marked by excitement and scandal. To begin with, his appearance in Switzerland was accompanied by a dramatic episode. Shortly after his arrival in one of the largest towns in that country, he appeared before a

MADNESS IS IN THE BRAIN

group of students carrying the written works of all the celebrated medical authors prior to that time—men whose works were respected, whose teachings formed the backbone of medicine, and with whom one never dared to differ. He lit a flame under a brazier and then, in the manner of a wizard or a necromancer, he tossed in the books one after another, telling the famous authors that they should learn from him, and that he would not learn from them. Such behavior, of course, excited the students. They cheered him and started a great deal of discussion around the town, in which Paracelsus reveled.

He was a boyish sort of individual, with black, piercing eyes, and a gruff manner. He never hesitated to tell other physicians that they knew nothing, but yet at the bedside of a patient he was the kindest man imaginable. Perhaps he was the original of today's Park Avenue specialist who is known for his bedside manner. Followers in huge numbers flocked to his clinic. He had made up his mind that he was going to cure people, so that, unless it could actually help, he was not interested in what Galen had taught, or what tradition had to say about disease. What he intended to do with his patients was to bring them out of their sicknesses, and he applied this ideal to mental medicine, claiming that the insane should be treated as sick people.

Unfortunately, he mixed up his medication with astrology, and necromancy, and fell somewhat afoul of the clergy by emphasizing alchemy, which just at that time had been interdicted.

Such conflict as he had with the Church and with other physicians, however, seemed never to do him any harm. He prospered, had a tremendous practice, and outside of the fact that he has been labeled as a quack by medical historians, nothing much against him has survived in history. But one fact in his favor certainly has survived, and that is that he emphasized

MEN AGAINST MADNESS

for the first time the important point that mentally sick people were sick and not merely deity-damned sinners. Here was a job for medicine to do, he urged, and not a job for the clergy. It is strange that it was only a century ago that an idea dating back to the Middle Ages finally percolated into the brains of those having to do with the insane. Even today it is not unusual to find a layman who brings a relative into a mental hospital, not with the idea that his relative is a sick person, but believing he is just cursed, and paying for some evil deed in his past.

Physicians in those days were pretty cantankerous. They were easily insulted, and apparently there was a good deal of squabbling among themselves in their efforts to make money. Each one had to put on a little better show than the other in order to get students, for even the universities were dependent upon the ability of the individual professor as a "student-getter."

Another little man, fully as nasty as Paracelsus was in his best days, was one Jacques Dubois who, at an early age, devoted himself to the study of languages, and later took quite an interest in medicine. He studied the works of Hippocrates and Galen, and devoted himself assiduously to collecting such knowledge as he could of the human body when an opportunity presented itself. On one occasion, when a mason fell off a roof and was badly hurt, Dubois made quite an anatomical investigation of this individual. He also dissected and studied the body of a woman who had died at childbirth, and gradually by such means developed quite an extensive knowledge of anatomy. Students flocked from all over the civilized world to learn from him in Paris, where he had settled down. Poor as a church mouse, he could not defray the expense of getting a degree, so that the members of the faculty of medicine in Paris, when they saw their students leaving them for his more fascinating lectures, clamped down on him and said

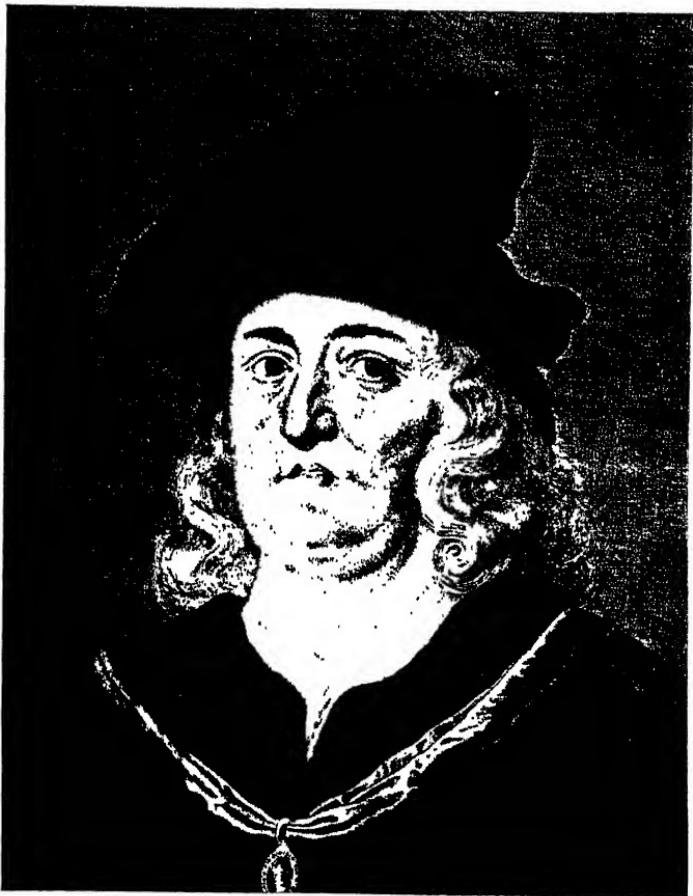


Plate VII

PARACELSIUS AT THE AGE OF TWENTY-ONE

From a painting by Van Scovel, in the Louvre Museum, Paris

MADNESS IS IN THE BRAIN

that he could not practice any more. There seems to be no criticism of what he taught, rather that he taught too well. Like so many others through the ages, when he found that he would have to complete some academic requirements, he took himself to Montpellier where there was a good medical school and acquired a medical degree. As soon as he could, he then returned to Paris and, having lost none of his art of self-expression, he soon attracted again huge classes of students, oftentimes numbering from four to five hundred.

Let us look at one of these classes. Among his students one day were two, Andrew Wesel, who was later to be called Vesalius, and a young chap whose later name was Servetus. They carefully listened to the master, watched the dissection he made, and went away praising him. But young Wesel had a contemptuous attitude. He came from a rich family, his father being a court official, and he was well supplied with cash. DuBois, or Silvius as his name is latinized, was a rather nasty little specimen, but he did make the work attractive. Vesalius and Servetus walked out of his lecture hall when Silvius completed the lecture. They wandered on for some distance without saying anything. Finally, Servetus turned to Vesalius and said, "What a nasty old man he is," with which opinion Vesalius promptly agreed.

Vesalius then asked Servetus whether he believed the story that was going around about Silvius' starving his servants. There was not very much question in the minds of either of these men that it was probably true, for Silvius was known as an avaricious sort of chap.

"Undoubtedly these stories are true," said Vesalius. "He gives his servants nothing but bread and water. They look starved. They don't have very much energy."

"Well," said Servetus, "he can teach anatomy. It is remarkable what he showed us today. There was the brain, and at-

MEN AGAINST MADNESS

tached to it was the spinal cord. The only thing that I don't understand is where the *rete mirabilis* is."

"There is no question that it is there," answered Vesalius. "One can see that there is a net of blood vessels all over the brain. But we must give this thing thought. It is very interesting to see how the body is constructed. Silvius is a wise man—he tells us to look at animals, but perhaps to look more closely at the human body and we will learn something. The only thing that I disagree with him about is his idea that we should not have any anatomical pictures. Wouldn't it be easier, when we have to sit in the back of the room, if we had some sort of drawing to look at while he dissects, instead of craning our necks trying to see the small things that he is doing?"

Servetus agreed.

"Some day I am going to make these dissections myself," Vesalius said. "I am going to have some real drawings made, you can count on that. Meanwhile I think that we have gotten all that we can from Silvius, so let's go elsewhere."

Servetus and Vesalius traveled from one clinic to another. With all the important preceptors in the east of Europe they studied, and finally ended up in Italy.

There had been a great revival of learning in the Peninsula. The educated citizens of Italy were imitating the Greeks, but at the same time they were stressing naturalness. The natural style was being adopted among painters, and the influence of Leonardo, among others, was already being felt. In spite of the constant tumults of continuing wars, science was progressing by leaps and bounds. One reason for advancement of medical knowledge was the need for proper military surgery. No leader of a nation likes to have more of his soldiers die than is absolutely necessary. If possible their lives should be saved so that they can go back and fight another day. Medicine,

MADNESS IS IN THE BRAIN

then, should be encouraged. That was the military point of view.

But more important in fostering the advancement of medicine than the need for better military surgery, or the encouragement of art for the sake of beautifying Italian leaders, was the invention of printing. Without having to take long journeys on horseback it was at last possible to acquire some measure of knowledge of what was known hither and yon by other students. To learn something about anatomy, it was no longer necessary to hear a number of lectures, to dissect a cadaver or to see one dissected. It was possible to have at hand the opinions of many others who had done the same thing, and who had made studies of the very thing that interested one particularly. In the clear light of the printed page, the works of Galen were opened very seriously to question. No longer could one blame the handwriting of the monks for some obscure mistake, and one could not say that there was an error in transcribing, when the error was really one of observation.

Vesalius, fascinated by the study of anatomy, took himself to Venice, where not only was the study of anatomy encouraged by the monks, but this encouragement was in sharp contrast to the attitude taken by ecclesiastic authorities elsewhere toward the sacredness of the human body. Shortly after coming to Venice, Vesalius, strangely enough, became acquainted with Ignatius Loyola. We have no way of knowing how close their contact was—probably not very close because they had little in common—but nevertheless these two contemporaries did come in contact with each other.

Following up his anatomical studies, Vesalius became professor of anatomy in Padua. There his ability attracted a tremendous number of students, and he gained great fame. His real title was Professor of Surgery, but his earliest act after being appointed was to approve the teaching of anatomy, and

MEN AGAINST MADNESS

he did stress this subject to the fullest. Before coming to Padua he had become acquainted with a young artist, John Stephen Calcar, and it was association with this workman that enabled Vesalius to do as much as he did for anatomy.

Vesalius made some wonderful contributions to anatomy, the earlier of which do not interest us here because he neglected the nervous system. Why, we do not know. Perhaps the plates in his earlier works, which illustrated the nervous system, have been lost. These early works are made up of huge pages, each with an illustration of the part of the body which he intended to show. The drawings were beautiful and accurate. His great work, however, was known as the "Fabrica," which was composed of beautiful works of art, wonderful drawings, and which Vesalius himself admitted, cost him a great deal of worry, effort in making the dissections, and arguments with the artist. Like so many other artists, apparently John Calcar, if he was the one who did these engravings (and it is quite probable that he did), was a headstrong sort of fellow. But the results were worth while. One has only to see the drawings of the human skeleton leaning against the trunk of a tree with a background of a small Italian village, to appreciate that here art and anatomy are combined.

In Vesalius' day there were not yet the cold, diagrammatic drawings which are found in the anatomy books of today. No, there was nothing to stop the skeleton from looking over a parapet, and it was not considered incongruous for an individual, denuded of his skin, and having a few muscles lying around loose, to be represented as taking an interest in a pastoral landscape. In one drawing, in particular, there was an artistic pose; the artist here had the dissection standing gracefully on his feet, holding up a muscle or two which were attached to his head, so that one could see the muscles beneath them.

M4 ANDREOP VESALII BRUXELLENsis

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Plate VIII

One of the illustrations from Vesalius' "Fabrica"

MADNESS IS IN THE BRAIN

Aside from the artistic beauty of these drawings it must be noted that from Vesalius at last had come real gross anatomy of the nervous system. His drawings of the brain, the spinal cord, and the nerves which reach from these organs into the most distant part of the body, accurately reproduced reality. They represented careful dissections, they were beautifully drawn, and it remained for future anatomists only to work out the microscopic and the most delicate details of the anatomy of the nervous system.

But Vesalius, because of his accuracy, "started something," for when Silvius heard that Vesalius had denied some of the so-called truths of Galen and maintained that certain bones were not present, and that the shin bone, for instance, was not curved as Galen had said, he threw a tantrum and accused Vesalius of being a faker. Moreover, he said that not only was Vesalius wrong, but Galen must be right, that if the shape of the bones was not as Galen said, why then man had degenerated, and the bones had straightened up. And if the short bone that Vesalius had said wasn't present couldn't be found by him then it was proof that Vesalius was careless, because Galen *must* be right.

In the whole history of medicine, particularly of psychiatry, we have had conflicts arising when the reactionary clamps down on the young revolutionary. This was the case with Vesalius, but by the time this conflict arose he had built a reputation for himself and he was willing to go to meet Silvius more than half way if he wanted a fight. So in the dedication of his next volume he told Silvius what he thought of him. He had been brooding about Silvius since his student days, and finally he spoke up and accused him of being an avaricious and nasty little man, which undoubtedly he was, for one of his biographers says that the only time Silvius was known to laugh was when he had discharged a couple of servants and

MEN AGAINST MADNESS

sold a mule. Vesalius also made a few other comments which are worthy of note. Silvius, he remarked, didn't dissect any human bodies (although we are pretty sure now that he did).

In short, Vesalius lost his temper. He seems to have been a hot-headed individual, for shortly after this controversy he threw up his professorship to take an easy job with the King of Spain, who at that time had possession of just about all of Europe. He got along well there, and, when the son of King Charles V, Philip, who was later to become Emperor in his own right, fell down stairs and fractured his skull, during a playful amorous interlude, Vesalius patched him up and put him together again so that he functioned about as well as a medieval king could have been expected to. Unfortunately, he was not any too good as a king, but so far as Vesalius was concerned, Philip was all right, for, although he changed the administration when he succeeded to the throne upon his father's death, he kept Vesalius in his job.

Meanwhile, Vesalius had given up doing research. He was living on his reputation, allowing some of the controversies that had disturbed him in Italy to quiet down. Whether Vesalius made a wrong political move, or whether he was caught having an affair with the wife of an influential noble, or whether he decided that it was too bad that he had given up anatomy and was on his way back to Italy to resume his post as professor, we do not know, but at any rate he did leave Spain, and he went via Italy to the Holy Land on a pilgrimage, which makes one think that he had something to atone for. On his way back, the boat in which he was sailing was wrecked on the Isle of Zante. Just how Vesalius died is not known, but shortly after the shipwreck a peasant, investigating a hut on the island, came upon his body.

From our standpoint, it is not only his beautiful diagrams of the nervous system, and the fact that he made gross nervous

MADNESS IS IN THE BRAIN

anatomy exact, but the fact that he began to reveal a little of the true meaning of what the nervous system was, that gives him significance. His predecessors had an idea that the blood was a stationary column of fluid, that it throbbed rather than circulated, that the spirits were generated in the heart, and passed through the brain, where a special kind of spirit was elaborated, which in turn held the soul. With no knowledge of the circulation of the blood, which was to come soon, naturally physicians had no idea that the brain or any part of the body could be nourished by the blood, or that there might be any function of the blood itself.

Vesalius, however, had some ideas about this, among other things, so that he should be considered more than an anatomist; he was a physiologist too. In fact, perhaps he was the first real physiologist who tried to explain the workings of the nervous system and of the mind. His predecessors were filled with various theories about animal spirits and vital spirits, and, no matter how they dealt out proportions of these spirits or fluids of various sorts, they still were no nearer an explanation of the mystery of thought and mental reaction than had been the Greeks, or even, perhaps, prehistoric man. All they knew was that God had given life to the human being and that somehow or other he "thought." He was able to work out problems, do mathematics, and in other ways prove himself superior to animals. Theologians interpreted this superiority to the Biblical statement that the Lord had made man in His own image, and this argument had a tendency to put hurdles in the way of those who wished to do more exact research. By what right had they to interpret man's thoughts when, after all, these thoughts were put into man by the Lord himself? It was all right, of course, to investigate anatomy because that was the Lord's work, but the soul was something different and thought was the function of the soul. Today, perhaps, our

MEN AGAINST MADNESS

attitude is that life itself is the function which has come to us from God, and that it is undoubtedly no sin to understand not only how the body is shaped but also what makes the wheels go round.

For Vesalius or others of his contemporaries to make such a study, however, was heresy. Vesalius' good friend, Servetus, who made many great anatomical discoveries, because of a little quibbling was tied to a stake surrounded by fagots and burned, much to the pleasure of theologians whose fame now has disappeared in contradistinction to his, which will live on for generations.

There can be no doubt that Vesalius was a shrewd politician, and by his political acumen, he saved himself from drastic treatment by theologians. When times got bad in Padua, he got himself a comfortable berth in Spain. When his mentor died, Vesalius already stood well with the heir to the throne. In other times and in other generations the poor anatomist or physiologist has had to take punishment, but not so Vesalius. While he was a shrewd, scientific observer and did not hesitate to record what he found, he drew the line very carefully between what he thought was a new discovery, and speculations which would bring down upon him the criticism of the clergy.

In spite of Leonardo da Vinci's clever work in studying and revealing the anatomy of the ventricles or hollow spaces in the brain, there were many surgeons and anatomists contemporary with Vesalius who still had an idea that these gaps followed one another in a series from the forehead to the back of the skull, very much like a train of cars. In each one of these hollows, they believed, there was a filtering process of thought, but Vesalius ridiculed such ideas. He admitted that undoubtedly thinking processes of various sorts were localized in the ventricles, but he pointed out that what probably happened was this: The heart and the liver elaborated spirits, par-

MADNESS IS IN THE BRAIN

ticularly the heart, which elaborated the vital spirit. The vital spirit passed into the brain and there was mixed with air, which passed from the nose, through holes in the skull, into the blood vessels covering the brain. Here it was gathered into a little space where most of the blood collected—probably the area which Herophilus described—and thence into the ventricles. Since the ventricles were symmetrical, or in the mid-line, the functions of the brain were equally divided. Vesalius knew that it was necessary to have a brain in order to think, because he had seen how animals reacted after the brain was removed.

At least, he had a conception that a brain is required for existence, but certainly his attitude on the subject was not enough to impress either his contemporaries or those who followed him, for many years; for it was not until about a hundred years ago that real animal experimentation on the brain was of any significance. Vesalius did know that if the nerve going to a muscle were cut, the muscle would not react, although his ideas were somewhat hazy on the subject. He wasn't quite sure whether the animal spirit from the brain passed through the spinal cord and nerves like water which would come up a spring by capillary action, or whether the nerves were tiny, hollow tubes. He says he thought it might be just as well not to speculate on this for it was not up to him to criticize God's handiwork. There we have again our cagey Vesalius in all probability looking out as much for his skin as for his scientific reputation; but he was very wise to take that attitude for it established him among his contemporaries as a careful observer and not a speculator.

He did do one rather bold thing: He said that he didn't see why animals should not be assumed to have intelligence and as many other mental traits as man; for in comparing the heart, lungs and other organs of various animals with those of

MEN AGAINST MADNESS

man, he could see no important difference. And he wasn't at all sure that the same principle did not hold true of the brain. In other words, he was the founder of comparative psychology, the study of animal learning and behavior in relation to those of man.

Up to this point human thinking was largely a matter of interpreting what could actually be seen, particularly that which could be seen without too much trouble. For a few hundred years men had been willing to dissect the human body, to observe closely, and to report their findings; but after this period was closed, there was little more that could be reported. It is very true that with the constant increase in knowledge of anatomy, and after William Harvey's discovery of the circulation of the blood, structures which perhaps had been seen before but which apparently had no meaning were rediscovered and reinterpreted, and more minute structures were undoubtedly disclosed even before the use of the microscope. But it apparently occurred to few of the investigators in Italy to find out what relation these anatomical structures had to disease.

Silvius had advocated studying a dead body, whenever possible, and trying to find out what had been wrong when an individual died. The cause and effect of disease (pathology) or the use of the structure, as indicated by the fact that use stopped when the structure was destroyed or injured, had not been very much investigated.

Shortly after the death of Vesalius, a nice old German physician by the name of Werfel made a study of four people who had died of what was already known in those days as apoplexy. Suddenly, for no reason, during their daily activities, their faces had turned livid, and one side of their bodies had been paralyzed, was fixed, and would not move. While the condi-



Plate IX

APOPLEXY

Photograph of a brain showing a hemorrhage on one side which causes paralysis of the opposite side of the individual.



Plate XII

MODERN PHOTOGRAPH OF THE BASE OF
THE BRAIN

MADNESS IS IN THE BRAIN

tion was definitely recognized by a number of physicians, Werfel went further, opened the cranium, and observed that in it there was contained vast amounts of blood. In cleaning away the blood, he found that some of the blood vessels had been damaged, and thus a whole new field of the physiology of the brain was disclosed.

Investigation had come to the point where, when something had gone wrong with a patient's thinking processes or his ability to get around, the physician looked in the brain for an explanation of the difficulty. He attributed to definite damage of some part of the brain its failure to function. It must be admitted that so little was known about the processes of thinking, and the ideas were so primitive about psychology in general, that up to this time insanity and disorders of conduct had not been attributed to anything in the way of destruction of brain substance. As a matter of fact, even today we are unable to find anything actually the matter with brains in many types of insanity.

In those days, to look inside the cranium to find out why a man lost consciousness and why his side was paralyzed, was a great progressive step. Either because historical records are more complete from that time onward, or because a great deal more work was being done on the subject, the whole matter of the physiology and anatomy of the brain began to be more and more closely analyzed. Every anatomist was looking for small structures in the brain, and looking for places where blood vessels were running in the brain and other structures in the nervous system. The whole subject was being opened to critical inspection.

The large structures, such as cerebrum, cerebellum, and the connections between the cerebrum and cerebellum and the spinal cord had been, as we noted, described hundreds of years

MEN AGAINST MADNESS

previously. But so much else was being done to stimulate some interpretation and some understanding of brain function that important ideas were sure to be developed.

It was at about this time that Harvey discovered the fact that blood actually circulates and that, if there were such things as vital spirits and animal spirits, they didn't just float around in the blood stream. Because of the fact that physicians like Hook and others were beginning to study the properties of air and to realize that oxygen is actually absorbed into the blood stream and carried about in the blood, a whole new picture of physiology was on the verge of being unveiled. So life was no longer to be considered just a matter of ethereal spirits which were floating about aimlessly in the blood stream! Even certain rather casual observers pointed out that there was a change in the amount of blood entering the brain and being found in the smaller blood vessels, and it began to be realized that blood was being distributed to the brain—the brain was actually being nourished by the blood!

Studies of this sort stimulated René Descartes. It may seem peculiar to us nowadays—when we recall Galileo and others who stood their ground for scientific principle, even to the point of being put to death—to realize that this man, one of the greatest philosophers, even if he is not one of the greatest scientists, found it necessary to be just as careful about his private welfare as was Vesalius. To find one great man in a generation who was more careful of his skin than of his scientific reputation might be expected, but to find two great men, two real celebrities, who were very careful about what they said, for fear of getting into trouble, seems to us today, with all our freedom of speech, quite surprising. But Descartes was a very bright little fellow. His ability to think was not limited to physiology; he founded descriptive geometry—the bane of every first-year engineering student—and pointed out some

MADNESS IS IN THE BRAIN

very significant facts about the refraction of light. In the field of physiology of the brain and the nervous system, which formed part of his discussion on the functions of the body as



Plate X

EARLY DRAWING OF A REFLEX

A diagram from Descartes' own manuscript dealing with the nervous system.

a whole, he expressed some very pertinent notions. He conceived of the body as a purely mechanical apparatus.

Descartes thought of the nervous system as a sort of glorified and automatic soda fountain. For example, if one were to stick his great toe into a fire and were burned, a little thread in the nerve running down to that toe was pulled by the heat. This in turn opened a sort of a hydraulic valve which allowed

MEN AGAINST MADNESS

fluid in a particular part of the brain to mix with other fluids, raising the pressure to pull another thread or group of threads in turn, and these threads moved a muscle in the leg thus permitting the man to get his foot out of the fire.

Descartes' description of his idea of the way the nervous system worked is picturesque. He describes a sunken garden where there are all sorts of pneumatic devices. If someone walked along and trod on a certain board, near a fountain, there is disclosed before him a statue of Diana. He steps on another board, coming closer to her, and, operated by some sort of hydraulic device, actuated by a pedal under the board, bulrushes cover her. Say that he then keeps on walking toward the statue and steps on another loose board—this actuates still another hydraulic device (perhaps something like modern automobile wheel brakes) and a statue of Neptune rears out at him viciously, thus frightening the Art-lover and forcing him to turn to one side where he again steps on another pedal, which causes a mechanical sea serpent to come dashing out at him.

From Descartes' descriptions of this Rube Goldberg contraption, one doesn't know exactly how it was arranged, but any one who has any knowledge of hydraulics could visualize the fact that, if one were to step on a pedal like the hydraulic brake pedal of a motor car, thus forcing fluid into the actuating mechanisms of the brakes, expanding them so that they would grip on the drum, all sorts of devices could be operated in the same way.

No longer was behavior a matter of the actuation of something rather mysterious, the soul, but instead science had for the first time developed a distinctly mechanical point of view of bodily function and behavior. While even today psychologists are not entirely mechanistic in their ideas, it is definitely known that there are electrical currents and that there are

MADNESS IS IN THE BRAIN

chemical reactions in the nervous system and other parts of the body which do resemble machinery.

The one criticism that we might make about Descartes' theory is that he still believed in the animal spirit; he believed that the soul was located in the pineal gland, a small organ between the cerebral hemispheres, which today we believe to have no function whatsoever, but to be only a remnant of the third eye in reptiles. The pineal gland elaborated one part of the animal spirit, which was further made usable in the ventricles of the brain. It is doubtful whether Descartes believed in this theory. It was probably a sop to organized religion, to save himself from criticism. Were it not for this caginess, which he showed in several ways, Descartes might have joined Galileo and Servetus at the stake.

It is unnecessary to deal further with Descartes' theory, except to point out that his description of the way a foot was withdrawn from the fire had in it the elements of what is now called the principle of reflex. Today, even a bright child (not too young) knows what is meant by a reflex, namely the kind of action when, having stuck his finger on a hot stove, he jerks it away as fast as he can, "mechanically." The movement is performed without his having given any thought to it. While even a mature adult may not know the machinery behind it, the child quite likely calls it a "reflex." Descartes' explanation, in the middle of the seventeenth century, was not an unreasonable exposition of how this behavior occurs. We know today that the nerves are composed of "threads," but these threads do not pull back and forth like the strings on a puppet. They carry a current or impulse, which has many of the characteristics of an ordinary electric current, from the place where the skin has been heated to the spinal cord, and then from the spinal cord back to the appropriate muscle which contracts to move the limb. In other words, if a frog's

MEN AGAINST MADNESS

leg muscle is laid across two electric contacts and a current passes into them, the muscle contracts. It is this contraction of many muscles which causes the horrible contortions of a man executed in the electric chair.

In the same way the impulse passing down the nerve arriving at the muscle causes it to contract. Nobody is quite sure that this nerve impulse is just an electric current, but it does cause a delicate gauge of electric current to behave in the same way that it would were the nerve a conducting wire with a current passing down on it. We must recognize, then, that Descartes was right in principle if not in fact, and we must give him due credit for partially "mechanizing" bodily functions.

Contemporary with Descartes was a prominent English physician, typical perhaps of many of our famous physicians of today but having, I think, less character. While Descartes and Vesalius were very careful about what they said, so as not to offend the ecclesiastics, although they were doing original and dramatic research, Thomas Willis used his native shrewdness not so much to save himself from church criticism as to make a judicious political decision. When Charles I and Parliament were having their struggle for supremacy, Oxford was a chief place of contention. Let us consider this for a moment before returning to Thomas Willis.

There seems to be a modern tradition that scholars are not very shrewd; that they are idealists and rather inclined to pick the unpopular side of any political controversy. It was not so long ago that there was a great deal of agitation to make teachers in the United States take an oath of allegiance to the Constitution, because so many teachers were notorious radicals. One expects to see a sage nodding of heads in any gathering, should one condemn a local university for its radical tendencies.

MADNESS IS IN THE BRAIN

But this was not so, apparently, with Oxford. Although there was an actual revolution in England at the time and troops were waging war around the town of Oxford, the King's side of the struggle, which happened to be the successful side for Oxford to be on, was the side taken by most Oxonians. Because the troops of Parliament had never been able to capture Oxford, those King's men who were in the town during the difficulty which Charles had with Parliament were eventually rewarded by his Majesty. Among them was this Thomas Willis. He was appointed one of the Professors of Medicine, in spite of the fact the most significant reason for his becoming a physician was that he happened to be in Oxford and was quite comfortable there during all the bloodshed and strife in England.

Willis turned down no chance to make a penny. He had associated with him one Richard Lower, a man of really fine calibre, who was respected by all the other Oxonians and whose discovery of various functions of the heart, after Willis' death, were far more important in determining the future of medicine than were any of Willis' works. Willis was really the typical fashionable physician. He had a gift of smooth speech which enabled him to put the simplest ideas into the most florid phraseology, and this impressed his patients. He differed greatly from the majority of the other members of the Royal Society, then recently formed, and now famed, in that he was not as sincerely imbued with the scientific spirit. Francis Bacon, although he had lived many years before, had firmly planted the seeds of the inductive method, which really flowered with Harvey's discovery of circulation of the blood and with the various scientific discoveries in astronomy, physics and chemistry that came about the same time.

The little group of Fellows of the Royal Society at Oxford formally put physiology on its feet. At the beginning of the

MEN AGAINST MADNESS

seventeenth century little was known about the transmission of oxygen in the blood. The idea of oxygenation or even of circulation of the blood was rather mystical. But this carefully observing and carefully experimenting group brought light into the darkness. No line was drawn against animal experiments. Even careful weighing and measuring of quantities was, for the first time, indulged in, and Willis tried as well as he could to integrate himself with this group. Lower was somewhat contemptuous of him, but nevertheless helped him to write a remarkable book on the anatomy of the brain. As a matter of fact, some contemporaries call Lower the teacher of Willis.

And the interesting thing about Willis' work at this time is not so much the fact that he wrote this excellent book, for there were a number of observations in it about the structure of the brain which were highly accurate, but the fact that Willis had now presented to the world some concepts of certain parts of the brain that had particular significance. He located in one part of the brain an area for memory, another for will, and still another for reason. Also, he thought that the vital processes, that is, those having to do with breathing, digestion and actual living, were in the cerebellum. Probably this opinion was due to some of Lower's ideas, for Lower was the kind of man who would have operated on an animal and removed the cerebellum, thus causing the animal to lose its ability to control itself. We know now that the cerebellum is merely a co-ordinating mechanism, and that, if anything happens to the cerebellum of man or of a lower animal, the subject becomes weak on that side. He cannot grasp an object, or take accurate steps when walking. That is as far as the cerebellum actually seems to govern vital processes. But very close to the cerebellum is an area in the brain, closely attached to the spinal cord, which does have to do very directly with the heart rate,

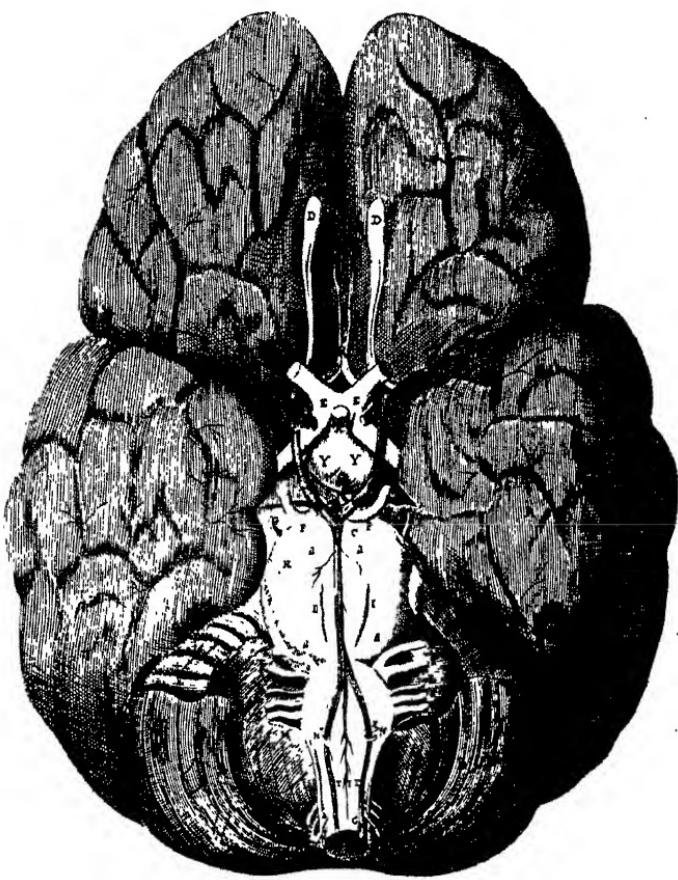


Plate XI

THE BASE OF THE BRAIN

From Thomas Willis' *Of the Anatomy of the Brain*; drawn by Christopher Wren.

MADNESS IS IN THE BRAIN

with breathing, and with all the very real vital functions. So Lower's discoveries, as transmitted through Willis, presented to the world the first idea of how the brain actually functions. The one interesting part of Willis' book which we cannot ignore is the fact that it was illustrated by that remarkable architect, the designer of St. Paul's and so many other wonderful churches in London, Sir Christopher Wren. Willis traveled in the best society.

And so ends the period of fumbling in the dark, a period when nothing was known about the mind. The history of psychiatry has passed through ages during which, little by little, the world has grown to know that human behavior depends on the integrity of the brain. Leonardo and Vesalius showed that the brain at least had a structure, so that, when function could at last be studied, Descartes, Willis and a scattering of others were able to point out that the brain is not merely an indescribable container for "vital" and "animal" spirits, but that it does serve as a center for thought and for the functions of living.

OFF WITH THEIR CHAINS!

BUT science was progressing in France, too, during these years. Perhaps because of the emotional and sympathetic nature of the French people, they were preparing themselves to take greater steps in the care of the insane than had been taken by any other single group. The earliest insane asylums were in Italy, but very little was heard from these Italian institutions; they were modifications of penal institutions, as were those in France. During the reign of Louis XIII the now celebrated hospital of the Salpêtrière was founded. Its origin is very interesting.

It seems that in an arsenal on the right bank of the Seine gunpowder was being made. Because of the inexpertness of those who handled it, there were frequent small explosions. Two of these were serious, one in 1538 and the other in 1563. These explosions practically rocked Paris. In spite of the fact that the King had great need for gunpowder at that time, for he was constantly waging wars within and without France, he obeyed the public will expressed after these bad explosions and had a small arsenal built on the other side of the Seine River. Yet, in all probability, it was not the popular decrying of the location of the arsenal that made him decide to move it, but rather the fact that the old arsenal had been across the street from the guild-hall of the vineyarders and the stocks of high-class champagne and other fine wines had been rocked by

OFF WITH THEIR CHAINS!

the explosions. As anyone knows, and no one better than a French king, good wine should be kept as still as possible.

So, across the Seine was begun the erection of the new arsenal. It had crenellated walls, deep moats, and in the center a château. But those days were not particularly peaceful. Louis XIII had his hands full. A revolution here, a little disturbance there, an attack from a third source, all took his mind off the small problem of building an arsenal. When finally along came the trouble of the Fronde, Louis' mind was entirely taken off the smaller matter and the arsenal remained uncompleted. In spite of the fact that when English-speaking psychiatric historians essay to discuss the history of this hospital, they refer to the Salpêtrière as having arisen from an ammunition dump, an arsenal really was begun. It was not just a dump, it was actually built as a gunpowder plant, and if Louis XIII had thought of the matter there probably would not have been any Salpêtrière.

Fortunately it was started, for in 1658 Louis XIII, realizing that the country was flooded with indigents, beggars and insane, decided that some sort of institution should be set up for them. There were at that time a number of separate hospitals scattered throughout the city of Paris, the Bicêtre for the insane and hospitals for orphan children, as well as some for the sick, which he brought together under a single management known as the L'Hôpital Général.

To administer this group of hospitals there was a board of various legal authorities, including most of the judges in the city, but the actual management of the hospital rested in the hands of a Mother Superior, who had about thirty nurses working under her. These were all nuns who had taken particular vows to aid the poor and impoverished. During the Revolution there was a most bloody riot in the hospital and scenes now famous in history were created when the authori-

MEN AGAINST MADNESS

ties decided to remove all the prostitutes of Paris and to incarcerate them in the Salpêtrière. Within the walls of the Salpêtrière was the Force Prison, which is made memorable in the novels of Dumas. Many of the important civic leaders during the reign of Louis XIV and Louis XV were immured within these walls. But far more important than the historical setting of the Salpêtrière was the fact that it stands in the history of psychiatry as a place where some of the important incidents in the early treatment of the insane took place.

After L'Hôpital Général was established there was a great deal of political interference. It is strange that, no matter how well an institution may be run by experts, politicians have to stick their fingers in, and this seems to be true whether the country is governed by a king or whether it is a democracy. Even today it is no unusual thing in some states to find that appointments are made to the medical staff, or even to the superintendency of a mental hospital, at the request of somebody who knows nothing about medicine, cares less about the patients, and is utterly indifferent about the future of the institution. This was the case in regard to L'Hôpital Général.

Its history, as far back as 1749, has a singularly modern sound. In that year the choice of the Sister Superior was in the hands of the board which I have mentioned above. During the first century of the existence of L'Hôpital Général the sisters were chosen by the directors, and were very devout and conscientious women, who were willing at all times to sacrifice themselves to carry out their difficult tasks, in order to do something for the poor inmates. We must remember, of course, that at that time not only the insane were cared for in the hospital, but also the mendicants, orphan children and others, making proper administration no easy job. The Sister Superior was usually chosen from among the sisters who had served a

OFF WITH THEIR CHAINS!

lifetime in La Salpêtrière, but in 1749 we see political tampering.

The Sister Superior died and the Archbishop of Paris, who was the senior member of the board, nominated a woman by the name of de Moison to replace her. It might be noted that the directors voted 12 to 10 against her, but nevertheless she was appointed. Probably the only thing that was in her favor was that she was of noble descent. One notices, in the history of the Salpêtrière, that the Sister Saint-Michel who had spent her whole life in the hospital, and who had asked for the position, was refused it because they claimed that she was a candidate of the wrong political party. Undoubtedly a religious woman of this sort was not the candidate of any particular political group, but merely of "right-thinking people." Nevertheless Madame de Moison did what one might suspect; being a political appointee, she thought that her job was safe, that she had sufficient influence with the Archbishop so that no matter what she did there would be no interference. She was quite pleased with her residence in the Salpêtrière and proceeded to make the best of it. Naturally, the patients did not interest her particularly. As a matter of fact, they rather offended her. There was a great deal of dancing and singing and carrying on in her quarters. At length the disturbance became so great that it really became a public scandal.

Finally the king had to discharge all the directors of the hospital, but rather foolishly he handed this administration over to the Archbishop who had been the original cause of all the trouble. Parliament objected to this and remonstrated to the king, but he would not listen. One historian claims that this particular event had as much to do with the bringing on of the Revolution as any other single activity which occurred in France before the actual overthrow of the Crown.

MEN AGAINST MADNESS

Forming part of L'Hôpital Général, in addition to the Sal-pêtrière was the hospital La Bicêtre. This was an institution long established for the care of the mad, and in that hospital were immured a number of the chronic insane, particularly until 1666, when the acutely mentally ill were segregated in the Hôtel Dieu.

These chronic insane were treated like animals. They were shackled to the walls of their cells, by iron collars which held them flat against the wall and permitted little movement. They could not lie down at night, as a rule, although occasionally the collars were opened and the patients were permitted to lie down on straw pallets if their hands and feet could still be kept shackled. Oftentimes there was a hoop of iron around the waist of the patient, and in addition to this hoop there were chains on both the hands and the feet. It was usually the custom to permit these chains to be sufficiently long so that the patient could feed himself out of a bowl, the food usually being a mushy gruel—bread soaked in a weak soup. Since little was known about dietetics, naturally no attention at all was paid to the type of diet given to the patients. They were presumed to be animals and as such they would have no discrimination, and would not care whether the food was good or bad.

No attempt was made to diagnose nor to classify them accurately. Certain terms were in use which offered a very general classification. For example, those who were raving and were dangerous, or who were extremely restless, enough so to do harm, were called maniacs. Those cases who were severely "in the dumps" were called melancholiacs. If they were just so mixed up mentally that they could not answer questions—well, the disorder was called dementia. Beyond this, there was no attempt to recognize different kinds of mental conditions; all the insane were merely considered madmen, and, as such,

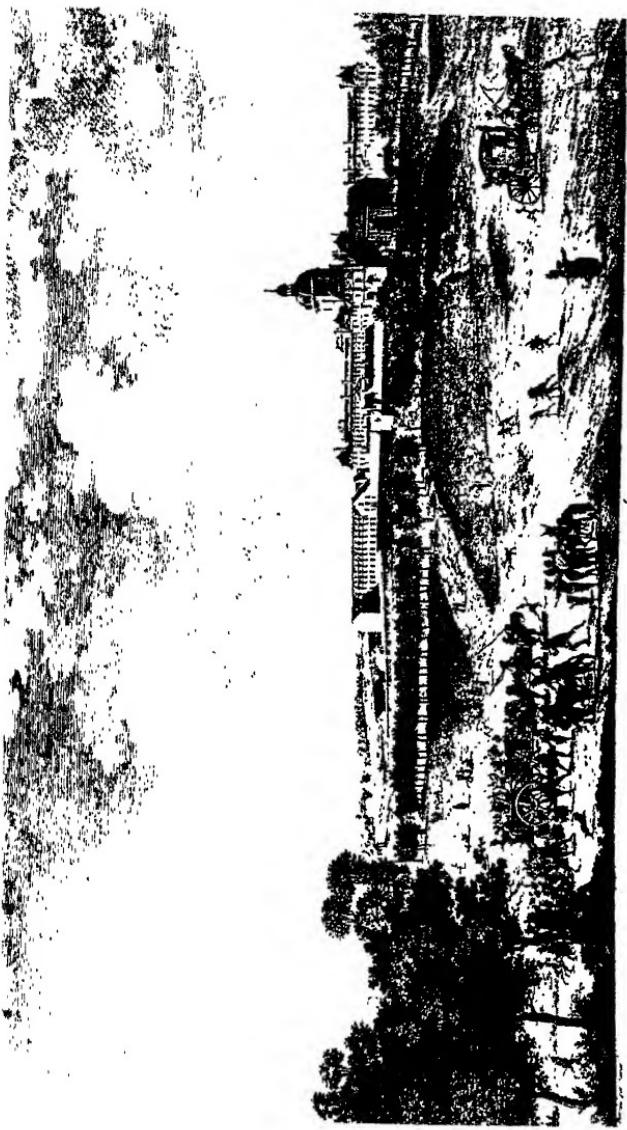


Plate XIII MODERN PHOTOGRAPH OF THE FRONT COURT OF THE SALPÉTRIÈRE

OFF WITH THEIR CHAINS!

were thought of as less than beasts who must, for the safety of other human beings, be locked up.

It is a surprising thing that there were no general laws passed to put them to death. Probably the old theological traditions that one had no right to take a life is what reserved them from merely being destroyed as would be useless animals. The cells in La Bicêtre, and in the other asylums of a similar nature, were box-like, dark, unlighted, with almost no ventilation, and had no means but a small grille by which sunlight could enter them. The doors were also grilled, and a certain amount of lighting could be obtained through the crevices in the iron decorations on them, but beyond that the poor patient remained in darkness all his days. No one visited him except to feed him. He was allowed to lie, sit or stand in the midst of all of the ordure in the cell, which was never cleaned, never swept. He was permitted to tear his clothing off and no attempt was made to keep him warm or to keep him covered. Not even the most elementary gestures of humanity were in vogue at this time. But that was soon changed, owing to the influence of Philippe Pinel.

Philippe Pinel was the child of impoverished parents. At first it seemed unlikely that he would be able to get an education. He did go to the university but, owing less to lack of intelligence than to a retiring disposition, it was necessary for him to study very hard to get ahead. His original inclinations were toward the classics and mathematics, and he became a very fine classical scholar.

When he was in his early twenties he studied medicine, and at the same time taught mathematics at the university. He was considered an extremely fine mathematician, and it is surprising that he essayed to go into medicine. In those days it was no profession for a timid and quiet youth. But it is very fortunate for the mental medicine of today that he did go

MEN AGAINST MADNESS

into this field, for while it is quite likely that someone else would have done just as he did eventually—the same tendencies were beginning to manifest themselves in Italy and England—nevertheless Pinel made the first step away from the treatment of the insane as animals toward their treatment as sick people.

We must not forget, of course, that even from the time of Paracelsus occasional mention was made of the fact that the insane were sick, but, somehow or other—because of their violent behavior and because of the difficulty in treating them, in curing them, and in controlling them, and because of their dangerous tendencies—the fact of their sickness was ignored.

Thomas Willis did “treat” the insane. As a matter of fact, he was such a money-grabber that in all likelihood he saw that he could make a good thing out of these afflicted people, and he is decidedly on record as a specialist in dealing with the mentally unbalanced. Pinel knew of his work, but Pinel was a different type of person.

For some time Pinel practiced in provincial towns, but patients did not seem to come to him. Whether this was due to his timidity, his quietness, or his lack of aggressiveness, one does not know, but he was extremely impoverished. The idea occurred to him that he should go to the big city. Why it is that, so often, the apparently second-rate physician who seems to be a failure in his own home town heads for the big city, where there is more competition, I do not know, but in Pinel’s case it was a fortunate move. He arrived in Paris during the reign of Louis XVI.

There he was, friendless, with no real relatives or friends to take an interest in him, no one to help him make his way, but with an immense amount of erudition and mathematical knowledge.

OFF WITH THEIR CHAINS!

It was not long before he became acquainted with a little group of well-known writers, physicians, and mathematicians. Strangely enough, they all urged him to continue with mathematics. They realized that his placid appearance, his lack of aggressiveness, and his quiet behavior would militate against his being able to build up much of a practice in medicine. But they did try to help him all they could. Some physicians, friends of his, who had political connections, arranged for him to be appointed as physician to the aunts of the King, a relationship very far removed in all probability from the rank of Physician to the King, yet one which would carry with it some emolument very badly needed by this young fellow who had had to walk all the way from his home town to Paris. He was introduced to these ladies, and he stood speechless; in fact he had so little to say, exhibited so little wit, friendliness, or amiability that they immediately put their tiny feet down and said that they would have none of him.

Pinel next applied for various positions, and it is related that after four unsuccessful attempts to become a physician in the hospitals in Paris he finally was listed in the competition and came up before the examining board. One of his competitors was a gigantic military surgeon, with an immense physique, and a sergeant-major's voice. Pinel's erudition was probably far greater than that of the army surgeon, who, according to Pinel's biographer, knew practically nothing. Just as Pinel would have failed in a hog-calling contest, he failed in this job-calling contest. His voice did not boom loudly enough, the military man drowned it out and got the job.

Pinel was down-hearted but he did not complain; he just waited. Then came the Revolution. This was a mixed blessing for Pinel. Most of his friends, while probably not of the aristocracy, were of the upper classes, and, although Pinel was a

MEN AGAINST MADNESS

poor man, he was erudite and the erudite during times of revolution are usually suspect. Nevertheless he managed to keep soul and body together during the worst days of the Revolution, and when his three good friends who had previously been trying to get him appointed to other positions were put in charge of the hospitals of Paris, they immediately spoke up and said: "Pinel is the man to take charge of the Bicêtre," for his interest in the insane was well known.

In 1782 Pinel had been sorely grieved when a very dear friend died. This friend was a young man who was impoverished and very much depressed over the fact that things were going so badly in the world. Having wandered out into a forest, he was found dead next day with a philosophy book in his hand. His case had been badly mishandled by the local alienists in several institutions, so that Pinel had had an opportunity to see how the insane were being cared for. Because of his interest in this young man's case, Pinel had secured for himself a position in a private hospital, where his work had already proved impressive, and it was for this reason that his friends thought of him immediately when the opportunity arose to appoint someone head of the local madhouse.

Later on he became the head of the Department of Medicine in the University of Paris and his reputation was built upon the fact that, even when he was appointed head of the Bicêtre, he took what we now call a modern scientific attitude toward medical problems. He carefully examined every patient, kept complete records, compared similar cases with each other, classified his patients, and tried to prescribe treatments to fit the particular symptoms that each patient had, rather than following the general rules that all insane patients had to be manacled, purged and bled.

He tried various means of treatment, and his classical education made him realize that there was much to be learned



Pinel

Plate XIV

PINEL AS A YOUNG MAN

OFF WITH THEIR CHAINS!

from the rather calm, quiet, discerning attitude of the ancients, that rest, kindness, and an understanding of symptoms very often would produce a favorable effect on a patient when the most drastic medicine and other rather violent means would have no effect. / He was modern, too, in that he believed that there was a discoverable cause for every sickness, whether mental or physical, and he insisted that there be a post-mortem examination of as many cases as he could possibly investigate, to find whether there was any damage in the brain of the patient. /

/ In other words, he looked all around, inside, outside and through his cases. He classified and analyzed, and he was a real scientist at heart. / When he came on the scene, scientific medicine had arrived as surely as it is here today; for undoubtedly, if he had had the tools at his disposal which our present day physicians have, his habits of thought would have made him just as "up and coming" as anyone who is practicing in the twentieth century. His thoughts were as clear as glass; his logic was as accurate as his well-known mathematics; and there were, after all, men of intelligence among the French Revolutionaries, so that such thinking ability could not long be ignored.

"Put him in charge of the Bicêtre," the intelligentsia demanded, and, in spite of the fact that the leaders of the Revolution rather looked at him as an aristocrat, the demands of his friends prevailed, and he was put in charge of the institution.

/ He was appalled at what he saw there. Of course, he had previously gone through the Bicêtre and was acquainted with the procedures in the institution and of its physical layout, but when he was brought face to face with the grovelling animals who were called madmen, with the filth and squalor and abuse, medical man as he was, he could hardly bear the situa-

MEN AGAINST MADNESS

tion. He immediately demanded that things be straightened out.

In regard to his revolutionary work in insanity, Pinel mentions from time to time his friend Pussin, who was the actual director of the institution. Pussin was really a very fine character. While Pinel gets credit for being the medical man who revolutionized the care of the insane, he could not have done so without the co-operation of his headkeeper. Although Pussin was an uneducated and rather crude individual, nevertheless Pinel says again and again in his book that without that man's aid he never could have accomplished anything. He praises to the heavens those few keepers who were able really to understand the nature of the insane.

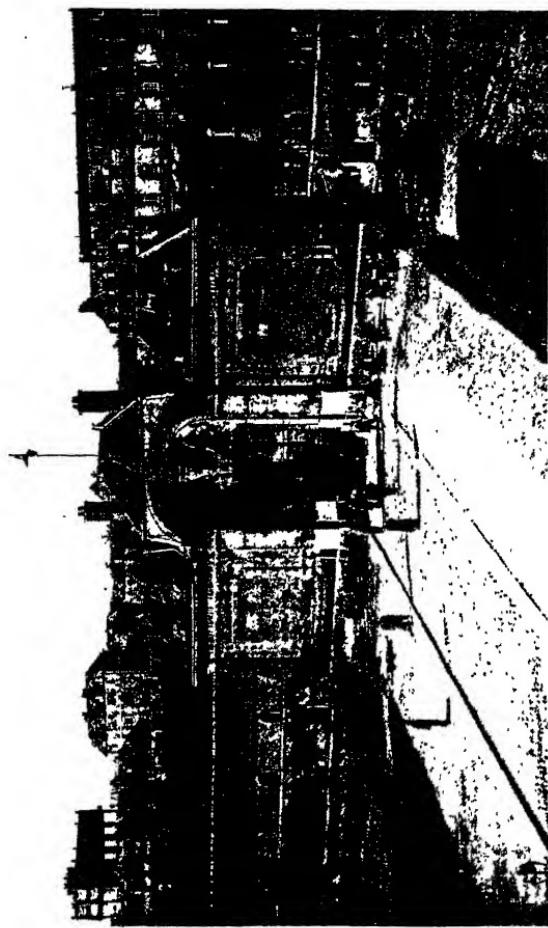
Soon after coming to the Bicêtre, he went into a consultation with Pussin. They discussed what needed to be done, and they agreed that the place was in a frightful state. As a matter of fact, the condition of the hospital was well known by the public, and it was considered as good as signing a death warrant for a relative, at that time, to have him committed to a lunatic hospital; but all that was to go by the board. Carefully considering his plans and talking matters over with his political friends, Pinel went before the Commune—a decidedly risky thing to do.

During those days of the French Revolution, one was much better off if nobody else knew where he was or who he was. Pinel in the first place was a suspect. There were vague murmurings of his being an aristocrat. Indeed, in spite of his rather mild manner, his timidity and his unprepossessing appearance, there was certainly an air of aristocracy, kindness and sweetness about him which seemed out of place in the surroundings of the Revolution.

Time and again he went before the Commune and de-

Plate XV

A MODERN PHOTOGRAPH OF THE GATE OF THE BICETRE



OFF WITH THEIR CHAINS!

manded that something be done for these insane. He demanded food for them, and he was laughed at.

"Food," they said, "why feed them? They don't know whether they're eating or not. As a matter of fact, they do better when they have no food."

At least a half a dozen times he returned and demanded that the chains be taken off these poor lunatics. He was laughed out of the building. First of all, the Commune wouldn't listen to him because he was not a commanding person, and secondly, his idea was ridiculous. But this little man, who was so self-effacing, had the persistency of a mule and the finest kind of medical softness. At the risk of his own life he kept returning and presenting his demands. Finally, he was listened to! It was one day after he had gone to the Commune, addressed the Committee on Public Safety and, as usual, been ignored. Finally, one of the leaders of the vicious triumvirate which had charge of the administration of French affairs at that time, took him in hand.

Robespierre, St. Just, and Couthon were a distinctly vicious group of individuals. Robespierre was cold and hard; St. Just, impulsively cruel; and Couthon combined about as many bad traits as possible, including a marked feeling of inferiority due to the fact that he was partially crippled. When the tribunal was to be commanded, St. Just would do it imperiously; when it was to be surprised, Couthon would do it threateningly. How Pinel ever expected to get any attention from people such as these, is hard to understand. Possibly he counted on his sincerity and on his extreme anxiety to do the right thing by his patients. But he stood again before these bloodthirsty revolutionaries, quietly waiting.

"What is it you want?" asked Couthon irritably.

"I want," replied Pinel, in his soft voice, "permission to

MEN AGAINST MADNESS

take the chains off my patients. I think that they can be helped. I am sure there are many of them that can be cured."

"Nonsense," Couthon replied. "Why bother us now? We have more important business to do."

But Pinel persisted. "I have carefully observed my patients," he said. "I know them well, and there are over fifty of them whom I desire to release. I want to give them the freedom of the grounds at the Bicêtre, and I will personally be responsible for them."

"Citizen Doctor," Couthon answered, "you have been suspected for a long time. This idea of yours seems to be about as foolish as any that we have heard so far. Why don't you go back to your lunatic asylum? You have charge of these patients of yours. Just see that they don't get out. That's all that we want you to do."

Pinel looked dubious. Something in his manner attracted Couthon's attention. It is probable that some of Pinel's influential friends had primed Couthon properly for Pinel's request and, too, Pinel's annoying habit of coming around to every available meeting might well have been the cause of his change of mind. Couthon finally gave in.

"I'll tell you what, Citizen Doctor," he remarked, "next week I will come around to your hospital and see what you want to do. If it is something that is good for the people of France, I will give you permission." Pinel went away feeling that at least he had made a short step forward. He asked his friends to remind Couthon of his promise and, sure enough, on the appointed day the cripple was brought to the hospital.

"Well, Citizen," he said, "you've been a lot of trouble to us, but let me see what you want to do."

Pinel took him into the courtyard. He opened a cell. The stench was horrible, and Couthon moved away. A madman darted at him and shrieked. Pinel and he had to call to each

OFF WITH THEIR CHAINS!

other at the tops of their voices so that they could be heard over the cries and wailing of the mad people in the nearby cells. Couthon tried to interrogate one of the patients, but the answer was unintelligible. He asked another one a few questions—the answer was a mad shout.

Finally he turned to Pinel.

"Citizen Doctor, are you mad," he said, "to want to unchain these vicious beasts?"

"They're not vicious beasts," Pinel replied, "but sick people. You'd be just as bad if you were chained up. They have nothing to live for. They're getting no treatment for their mental condition. I know that these mental cases are curable and, if we would give them treatment, we would soon see a change."

Couthon turned away. "You may do what you please with them," he said, "but I fear that you will become their victim."

No sooner was Couthon on his way than Pinel began his work. He had already decided which patients should receive this treatment. After talking to them for hours, and becoming thoroughly acquainted with their ailments, he had selected, as he said, fifty-six from the group, and these were to have their chains cast off. He began by releasing twelve.

He had already taken the precaution of preparing twelve straight-waist-coats with long sleeves. These were garments which reached down to about the knee and which, because the sleeves were long, could be tied one with another, thus making it possible for the patient to use his arms only to a limited degree. Not being able to seize, scratch, or choke his warders, nor do himself any harm, he was comparatively safe.

The first patient upon whom Pinel decided to try his experiment was an English captain who had been in the hospital for so long that no one knew his history. No one had heard him say more than a few rational words, and he was consid-

MEN AGAINST MADNESS

ered to be one of the most furious inmates of the institution. As a matter of fact, he had killed a keeper with his manacles some time before, and it had always been necessary to approach him with caution. On this day, however, Pinel by himself entered his cell and addressed him.

"Captain," he said, "I will order your chains to be taken off and will give you liberty to walk in the court if you will promise me to behave well and to injure no one."

"Yes, I promise you," answered the maniac. "But you're laughing at me. You're all too much afraid of me to give me so much freedom."

"Captain," Pinel replied, looking him in the eye, "you have known me for years. You know that I will keep my word, and I have six men here who will aid me in case you try to make trouble. Nevertheless, if you will agree to put on this blouse which we have here, I give you my word of honor that we will let you walk about in the court, and that we will take off your chains." *

The captain promised. His chains were removed by the armorer. And the keepers left him and Pinel together.

Because he had been shackled for such a long time, the captain found it almost impossible to rise to his feet. He tried again and again, but his legs were so weak from lack of use that he could not get upon them. Finally, as Pinel recounts in his memoirs, after a quarter of an hour he succeeded in balancing himself so that he could walk a little way. He tottered to the door of his cell and for the first time in forty years saw

* The frontispiece of this volume, although it is usually entitled "Pinel taking the chains off the patients at the Salpêtrière" is more likely a painting of his activities at the Bicêtre, for the construction of the buildings is typical of that in the latter hospital, and it is very hard to find any scene at the Salpêtrière that even remotely resembles the background of this picture. Of course, in the present-day Salpêtrière the professional staff is highly pro-Pinel. The nursing and attendant staff apparently has heard little about him except that there is a division in the hospital named for him.

OFF WITH THEIR CHAINS!

the sky. He looked up, tears came into his eyes; he took a deep breath and spoke.

"How beautiful," were his words.

He spent the rest of the day moving about, enjoying his freedom. He was constantly in motion, walking everywhere; and in each place where he went, he found new surprises. He had not realized how beautiful the world was, he said.

Finally, when dark came he voluntarily returned to his cell, which had been cleaned during his absence, lay down upon a bed which was far superior to the one which he had occupied for years, and slept peacefully. He was in the Bicêtre for two more years and never again did he have any paroxysms of rage or do any harm. He became a very useful person in handling other patients, for both his strength and his experience as a patient himself made him especially valuable.

It was not long before Pinel had released fifty-three cases, and the experiment had succeeded beyond his wildest hopes. Where there had previously been noise, filth, abuse, disturbance, and illness, all was now peaceful. The patients were co-operative; occasionally one would have a slight paroxysm, but, as Pinel says, "The whole discipline was marked with regularity and kindness which had the most favorable effect on the insane themselves, rendering even the most furious more tractable."

Pinel, perhaps, was more kindly than judicious. Although he was not an aristocrat at heart, as a physician he could not see the horrors through which the poor aristocrats passed without having a great deal of sympathy for them. It was all that a man's life was worth in those times to succor the proscribed, but his sympathetic nature made Pinel do some very foolish things. A nobleman or a priest could come to the Bicêtre and be locked up in a cell and, when the Guard would

MEN AGAINST MADNESS

come to take him away, Pinel would claim that he was insane and refuse to give him up. Tactics of this sort did not serve to ingratiate him with the authorities, and he had been under suspicion from the commencement of the Revolution.

Suddenly one night there was a furious disturbance: "À la lanterne! à la lanterne!" went up the mob cry which indicated that a counter-revolutionary or an aristocrat had been discovered. The mob came closer and closer, on and on—into the hospital. It seized upon little Pinel, dragged him out, and was about to dispatch him when suddenly one Chevigne, an old soldier whom he had freed from chains, dashed through the crowd, seized Pinel and rushed him back into the hospital.

This was the last time that any mob tried to harm him. Couthon's prediction that these madmen would be the death of Pinel was set at naught. Instead, one of them had actually saved his life. It is almost impossible to describe the amount of love and affection that his patients at the Bicêtre lavished upon him. In the short period of a few years, he became one of the most deeply loved persons in France. His work was understood throughout the city of Paris, and, when the mental wards of Salpêtrière were being rehabilitated, there was no one to be appointed to the directorship but Pinel.

Shortly after his appointment to Salpêtrière, he published his book on insanity. There are many aspects of this book which differ so little from Twentieth Century thought that were Pinel's book to be published in a modern edition it might be accepted by some of those who are versed in modern psychiatry but are not too critical as to contemporary writing. The ingenuity which Pinel used in handling his insane cases far surpasses that which one finds in second-rate asylums, now, even in the United States. He studied each patient carefully and applied to his case pertinent bits of knowledge which he had read in others' writings. In spite of his retiring disposition, when it

OFF WITH THEIR CHAINS!

came to scientific and controversial subjects, there was no holding him. He spoke his mind and stood behind his opinion, and he did not care in the least whose feelings he hurt. He says in his book that he is extremely skeptical of the results produced by such people as Willis, because Willis claimed to cure nine insane cases out of ten. Pinel maintained that that was not possible, and he makes the comment that perhaps if the case of the Queen of Portugal (treated unsuccessfully by Willis) had not been attended with so much notoriety, Willis would have listed her as a cured case also!

From our standpoint, a century and a half away from him, it is difficult to decide whether or not Pinel had a sense of humor. In his book he makes the comment that perhaps, as English authors claimed the English responded satisfactorily to small doses of cathartics, to his way of thinking, the French are different people, more rugged perhaps; they require larger doses. He may have meant this humorously; one doesn't know, but in view of the fact that he took his work so seriously one must doubt it.

One of the most common cures for mental disease throughout the centuries was to let out blood by venesection. Occasionally such a procedure may have given temporary relief, but it was a form of treatment which was very much overdone. Pinel frowned on it, and he took a highly rational attitude toward blood-letting. He was one of the earliest to steer physicians from a form of treatment which possibly cost the life of George Washington.

It was to be expected that a man as mild and as retiring as Pinel, who yet had the strength of character which he exhibited in his initial efforts to free the insane from their shackles, would basically be a humanitarian. He was not interested in freeing the insane for the credit that he would get. As a matter of fact, he was taking great chances that he would have to

MEN AGAINST MADNESS

face an investigation, if a freed patient should harm someone. His interesting work on insanity shows how he analyzed the various mental features in his patients. He looked into their backgrounds, found out what had made them go insane, and interpreted their thoughts in the light of his own experiences—those things which had depressed him he thought would probably be depressing influences on his patients—and to a certain extent we know now that he was undoubtedly right.

For instance it is believed today that depressions and periods of excitement in attacks of insanity usually have a more deep-lying cause than mere disappointment in love, or fear of the devil. Pinel, however, being a pioneer, had no way of knowing such things as this. The only thing that he could bear in mind was that certain dramatically sad or exciting experiences brought on insanity. Those experiences we nowadays call "exciting causes," as distinct from "predisposing causes" which may lie in the heredity, past experiences, and various deep-seated problems of the patient. The exciting cause is, so to speak, the straw that breaks the camel's back, and it was this that Pinel was very careful to observe.

Carefully watching the conduct of his patients, he drew from his observations certain generalities. He pointed out, for instance, that those cases which had epileptic fits proved to be more dangerous than those who were simply melancholic or even those who were somewhat excited. For the epileptics he urged segregation, and this undoubtedly was a very wise move. Insane epileptics are undoubtedly the most unpredictable of insane cases, and the most difficult to control. Even today with all our increased knowledge of psychiatry, we cannot be sure when one of them will have a period of excitement and actually become homicidal.

Pinel urged that teaching be carried out in his hospital, and



Plate XVI
STATUE OF PINEL IN FRONT OF THE GATE HOUSE
OF THE SALPÉTRIÈRE.
Courtesy of Dr. W. R. Miles.

OFF WITH THEIR CHAINS!

he always had half a dozen students with him, particularly after he got to Salpêtrière. When making his rounds he would express some of his thoughts in his rather retiring way, and he would tell the students:

"You must very carefully observe every case. You must find out what made him become insane, and you must treat the thing that made trouble for him. For instance, at the Bicêtre we had a man who was terribly upset by the Revolution. He felt guilty, and he unjustifiably believed that there was a sentence of death being placed on his head. He accused us of protecting him from the Commune and no matter how much we talked to him and tried to reason with him, he still was irrational. I called together a group of my friends, and they put on the garments of judges. They entered his cell and they said, 'We have come to try you. We understand that you have been accused of being an enemy of the Republic.' The man agreed and said that he had been, but that he was not guilty.

"Said one of my friends, 'Now that we have heard this evidence we find that you are not guilty but since you have been so troublesome during your stay in the Bicêtre, we will sentence you to six months more in this hospital under the care of Superintendent Pussin. If you behave yourself, you will be discharged at the end of that time.' They went away and for some time thereafter the patient was very understanding and co-operative. Unfortunately the treatment did not last and eventually he became hopelessly insane."

"But Maitre," interrupted one of the students, "is it really possible to treat these people?"

"Yes," said Pinel, "it is. Many of our cases get well, particularly if they are handled in a humane fashion. If we are kind to them, and show an understanding of their problems, it is not uncommon for us to be able to restore them sane and

MEN AGAINST MADNESS

sound to their relatives. I know this is contrary to the belief of many who dealt with the insane prior to the Revolution, but I attribute that more to the fact that the moral method of treatment was not in vogue. In other words, patients then were treated by physical restraint rather than moral restraint —by tying their bodies rather than obligating their minds."

"Is it your opinion, Maître Pinel," asks another student, "that the brain is actually affected in insanity?"

Pinel cogitated for a moment, then answered, "Undoubtedly that is the case occasionally. Certainly with idiots we see that they have malformed skulls. If you will look at the illustrations in my book, you will see that their heads have different shapes from the skulls of normal people. There are others who, if one examines their brains after death, are found to have diseased material in the brain. Unfortunately in most of the cases that I have seen it has not been possible to show that there is any such diseased substance, so that we must believe that insanity, in many cases, must be a disease of the spirit. If it is a disease of the spirit, why can we not treat it by treating the spirit by spiritual means?

"How far we can apply a moral treatment to insanity depends on the keepers and the sisters who aid the physician in the institution. In the Bicêtre, we had Pussin, who was a remarkable man. He understood the needs of these sick people, and made every effort to make them comfortable. There also was in charge a matron, who was a very wise and very calm woman. I remember that on one occasion there was a disturbance in the kitchen. The patients had started to seize kitchen utensils and other things, when the matron came in. One man in particular jumped on the table and was about to assault her. But, like the wise woman that she was, she showed no fear. She turned to the others in the room and said, 'Is it not nice of this man to come to my defense. He misunderstood you. He

OFF WITH THEIR CHAINS!

thought you were going to do me some harm, and here he is, this big brave man who wishes to help me.'

"At that, the man's passion left him and he quietly went about his business. It is understanding of this sort that is necessary in the moral treatment of the insane."

During his life Pinel attained practically all possible honors. Perhaps the significance of his changing the whole treatment of the insane so that insane asylums were no longer looked upon as zoological parks, but rather as hospitals, was not fully recognized by the time of his death. But his earnestness, his sincerity, and his scientific ability were.

He reorganized the Salpêtrière, and had under his wing a number of the most prominent of the young physicians of the generation following his own. Among them was a young man called Esquirol. To understand Pinel's character, one needs to note only his treatment of Esquirol. Esquirol was Pinel's assistant and Pinel threw everything his way that he could, so that when the time came for the selection of Pinel's successor to run the Salpêtrière, Esquirol was appointed, largely through the efforts of Pinel himself. It was not purely a matter of politics and friendship, for Pinel had sized him up as a competent person who was willing to go along in the kindly manner of his predecessor, one who had the interest of the insane at heart, rather than his own advancement. Pinel was proved to be correct, for Esquirol later developed a whole system of institutions which put France in the forefront of psychiatric treatment.

He established at least ten new institutions. Time and again he went before the various boards in the country to get money and to teach them the needs of the insane, and he insisted on the moral treatment of insanity. It was partly through his efforts that idiots were segregated from the other mental cases. And it was particularly necessary that the feeble-minded girls

MEN AGAINST MADNESS

who were all mixed up with the other insane, particularly at the Salpêtrière, be segregated. No one has any knowledge to-day of how frequently these young feeble-minded females were assaulted by attendants and male patients and gave birth to illegitimate children who had no place on earth, either from the social or the physical standpoint.

For many years Pinel continued to teach at the University of Paris, but in the twilight of his life there was a reorganization of the faculty. Responsible for this was the fact that there were a number of young politically-minded physicians who were not competent teachers, but who were jealous of the success of their masters. Most of the Senior Professors who were responsible for the development of the University were much like Pinel in personality—retiring, quiet, self-effacing and serious, so there was little resistance they could put up, and, when finally the faculty was reorganized, the most illustrious of them, including Pinel, were found on the list only of Honorary Professors. It is not uncommon for a man, particularly a physician, who has reached the height of his profession, to find that, instead of being a direction sign he is merely a target. And so it was with Pinel. Jealousies arose. Because of his mild personality he was unable to cope with them, and when he died he was snubbed by the medical profession.*

His kindnesses to the insane, however, had not been for-

* During a visit to France I made a special excursion to the Bicêtre. I spoke to the Concierge and asked for admission, saying that I wanted to see the Director. I was informed that the Director of the Hospital was on vacation. The Concierge asked me why I wanted to see the Director, and I told him that I wanted to see the parts of the institution where Pinel had worked.

"There is nobody here by that name," was his reply.

I carefully explained to him in good United States French that Pinel was a doctor who had been attached to the hospital over a hundred years before. This surprised him and he suggested that I see the head gate-keeper.

Again I asked to be shown that part of the institution where Pinel had worked, and again I was told that there was no Doctor Pinel and the records did not show any.



Pinel

IN GALLERIES OF

N.P.O. CARAVAGLIO

Plate XVII

PINEL IN HIS LATER YEARS

OFF WITH THEIR CHAINS!

gotten. Following him to the cemetery was a huge cortege. But it was composed of his ex-patients from the Salpêtrière and the Bicêtre—not of his colleagues. Leaders in art and science, and in literature eulogized beautifully over his bier, but there was no one there representing medicine. Evidently to save the face of the medical profession, the illustrious Doctor Couveillier, noting this deficiency, forced his way through the crowd and saved the day with well-chosen and beautiful words which, however, he admitted really fell short of what should have been said by Pinel's colleagues. Pinel was an old man when he died. He had had many interesting adventures, as well as performing valuable services for humanity and medicine. It is amusing to note that when Napoleon returned from Elba he spied Pinel in a crowd that had gathered to greet the Little Corporal. Quickly he marked the physician.

"Doctor," he said, "have the insane been increasing since I went away?"

Pinel said that he did not believe that that had been the case, but he notes that "My answer was 'No,' but I thought to myself that superior geniuses and shameless and ambitious conquerors are not exempt from a trace of madness."

Although the momentous occasion of Pinel's striking the chains from the lunatics has never been forgotten, and has been considered perhaps the chief milestone in the progress of psychiatry, there is a name which, in the minds of many, ranks with that of Pinel.

I insisted that over a hundred years ago there had been a Doctor Pinel whose work was very well known even in America.

After cudgeling his brains for a few moments he answered me:

"Oh yes, he worked here a long time ago. He was the fellow who used to keep the patients chained up; but we have changed all that now. All of our patients are treated very humanely. I don't think you would be interested in seeing the place where he worked."

I prowled the grounds and asked many people in authority where Pinel might have had his wards. No one seemed to know, in spite of the fact that there was a tablet dedicated to Pussin, diagonally opposite the Director's office, which was highly laudatory and referred in a very respectful way to the work of Pinel.

MEN AGAINST MADNESS

Pinel said: "The insane are, after all, human. They are not animals. No matter what the church or the ignorant may say, they have not been cursed by the Good Lord, and part of their bad behavior is due to the fact that they were not given a chance to develop as decent humans should."

But Pinel devised no way of controlling the insane, particularly those who were vicious. He still put them in straight-jackets. They were still held down. It was necessary from time to time to get a group of guards together in order to restrain one of his patients. During the momentous period of his tenure of office in La Bicêtre, another man was born who was to take the next step in developing the treatment of the insane.

This man was an Englishman, John Conolly. Educated in the same way as most of the boys of his day, he went to Grammar School, where he studied Latin without really knowing the meaning of what he read. Most of his time he spent construing the great Latin authors, but gained nothing from his early studies, a fact which he admitted in his own later life. He was, however, fortunate in his marriage with the daughter of a minor aristocrat. Partly as a result of this marriage into a moneyed family, and partly as a result of his own earnings, he was able to spend some time studying in Paris and other parts of France.

While in France he became imbued with the idea of studying medicine and he returned to Edinburgh, where he took his doctor's degree. It is interesting to note that his first research, his doctor's dissertation, was on the subject of insanity. It is said that even as a young boy, when he was taken to visit one of the insane asylums in Scotland, he was impressed with the inhuman treatment given to these poor patients that he resolved that sooner or later he would do something for the insane.

Before he started actually caring for the insane, he ex-



A handwritten signature in cursive script, appearing to read "John Conolly".

Plate XVIII

PORTRAIT OF JOHN CONOLLY

OFF WITH THEIR CHAINS!

pressed himself as wanting to enter this type of work. He spent some time in private practice in Scotland, and also in Stratford-on-Avon, where some of his initiative was made manifest by the fact that he was one of the organizers of a subscription fund to memorialize Shakespeare. But lurking in the back of his mind still remained the idea that something needed to be done about the insane.

He was appointed as a professor in the University of London, where he spent four years. During this time he told the students he thought that a course in the care and treatment of the insane should be included in the medical curriculum. Humanitarian methods were already in vogue in two small private institutions. One was the York Retreat, a Quaker institution headed by William Tuke, one of whose descendants later became the most important expert in psychological medicine in England. The other was the Lincoln Asylum, headed by Dr. Charlesworth and Mr. Gardiner Hill. Here the methods of non-restraint were already in vogue. No longer were patients shackled and put into strait-jackets, but were given a certain amount of freedom and recreation, and personal care and attention instead of mechanical restraint. It is easy for the reader to see how mechanical restraint, such as tying the patient to his bed or fastening him to a chair, would be degrading and would have an evil effect on the patient's mentality. He would feel that he was suspected of being vicious and dangerous, and that no faith was being placed on him.

Dr. Conolly remarked that, when he first saw attendants trying to restrain a patient, he realized how frightful it was—the patient's pupils dilated, he perspired and turned pale. Even the word "restraint" was enough to set him back in his progress toward recovery. But restraint had not been entirely discarded. As a matter of fact, it was still being used in some

MEN AGAINST MADNESS

asylums in France. La Salpêtrière and La Bicêtre did, of course, invoke the "moral" methods of caring for patients—talking to them, understanding them, watching them rather than tying them down and forgetting them—but in most other public institutions throughout the Continent and in England, various means of restraint were in vogue.

In one institution, along the wall there were a number of seats in which the patient sat so that straps could be placed about his waist and his hands fastened to these straps. The seats were a combination of chair and commode, and they at least had the sanitary effect of disposing of the patient's excrement rather than allowing it to foul the cell as had been the case when patients were shackled and manacled. Other patients were placed in bed and a broad sheet was tied across their chests and around the bed so that they could not move their hands, arms or bodies.

Conolly said that when he took over the Hanwell Asylum in 1839 there were restraints of all sorts hanging in the closet, perhaps no metal shackles or chains, but belts and cloth restraining-garments such as camisoles and strait-jackets, all of which were very degrading to the patient. He says that there were forty chairs, in each of which the patient could be strapped so that he would be immovable. As soon as he took over the Hanwell establishment, he broke up these chairs and used them to make a floor in one part of the institution.

His appointment as superintendent of the Hanwell Asylum was opposed, primarily, it appears, because of political reasons, as is so often the case when a group of laymen have to make a choice of medical directors. It is unfortunate that a lay appointing body never seems to understand that the progressive medical man must seem a little bit bizarre to the rest of his profession. But it was several years before Conolly, who really had at heart the interest of the insane and of society, was able to



Plate XIX

BEDLAM

A print by William Hogarth from "The Rake's Progress"

Through the courtesy of Dr Alfred M Hellman

OFF WITH THEIR CHAINS!

get the appointment at Hanwell. In the meanwhile, he even thought of setting up his own institution so that he could work with the insane. He was much criticized, both in and out of the profession, for his idea of non-restraint. Everyone claimed that it was not possible to control an asylum for the insane without tying everybody down. But after Conolly had made his first, second, and even tenth annual report on the state of Hanwell Asylum, the idea began to percolate into the minds of those who were interested in the theory that non-restraint did work, that one could do much more toward curing the patient if one would sit down and reason with him, if one would talk with him, than by frightening him and threatening to tie him down.

It is interesting to note, too, that Conolly was very much upset by the fact that courses in mental medicine were not being given to medical students, and he set up for the University of London training procedures which made it possible for medical students to come to his institution, in the quiet of the country, and to see what was being done to improve the condition of the insane. An admirer of Conolly's was Sir James Clark, who was Physician in Ordinary to the Queen and wrote a memoir of this reformer. We quote from this memoir a letter from the then celebrated Dr. Gull, describing the course which Dr. Conolly set up, but which was later dropped because of a loss of interest, much to the discredit of the authorities of the University of London. Gull says, regarding his visit to the Asylum as a student: "To the great majority of patients it was a matter of indifference, and to others it seemed to give pleasure. Generally the visit around the ward was carried on with as little inconvenience to patients as it would have been had it been in the wards of the hospitals of general diseases. There were occasions when it was necessary to caution the students against approaching or addressing

MEN AGAINST MADNESS

certain cases for, with some mental peculiarities, any familiarity would have caused excitement. As such cases were known beforehand to the physician, they were easily avoided, whilst they, at the same time, afforded important clinical hints. I may here say that the course of the instruction at the Asylum necessitated and enforced the careful demeanor of the students."

One can get from Gull's letter an idea of the farsightedness of Conolly, for he undoubtedly was one of the very first to recognize that mental diseases could be treated the same way as any other disease, that the asylum could be set up as a practical working hospital, that students could be taken through it and courses could be set up without inconvenience to either the students or the patients.

Conolly, also, it might be noted, was one of those interested in the setting up of Earlswood, one of the earliest institutions for the feebleminded, in fact, the earliest in the British Isles. Early recognizing the fact that the idiot was not an insane person, Conolly insisted that what he needed was games, some way of distracting him, so that he could lead a comparatively pleasant life where he would be removed from his distressed parents for the benefit of any healthy brothers or sisters he might have, and for his own good and protection. It was another interest of Conolly to study the construction of insane hospitals. To architects and others he made many suggestions which were adopted and are even in use today in the form of improved means and methods. For example, he emphasized the special need of sunlight and room for exercise and recreation in institutions for the insane.

The one criticism which seems to have been laid at Conolly's door, apparently unjustifiably, is that, whereas Pinel substituted the strait-jacket for chains, Conolly substituted the padded cell as regular "treatment." I do not think that this is

OFF WITH THEIR CHAINS!

true. It is undoubtedly true that he did segregate some of his patients. Those who needed quiet and solitude were put in rooms. He did establish such rooms as we now call padded cells, in which there is a large mattress on the floor, and padding on the walls so that the patient who wishes to damage himself by banging against the hard surface cannot do so. But—and this is important—the use of these rooms by Conolly became less and less frequent, and toward the end of his administration at Hanwell, their use was almost entirely discontinued. Conolly boasted that no patient was ever restrained at Hanwell during his fifteen years of administration of that institution.

Throughout his life Conolly stressed the fact that lunatics would progress faster and do better if they were treated as sick people, and that therefore the institutions in which they were kept should be run like hospitals. He did not make a great deal of progress, because he still used the term asylum, and all his drawings and his architectural plans were made up with the idea of an asylum as the basis.

Conolly stressed the idea of having single rooms. He substituted these for restraint, and he approved of the idea of seclusion. It was some time before this idea of seclusion could be gotten away from. Most of the attendants were lax and lazy—just country boys who needed a job and came to institutions because the standards of work were so low. It was all too easy for such as these to lock up the patients at night and then just forget about them. Not until the seventies of the last century was it realized by hospital superintendents who had to do with the insane that a night force as interested in the patient and as anxious to do what they could for the patients as possible, would be necessary in order properly to run a mental hospital. Within the last forty years in the United States there have been large public, and apparently

MEN AGAINST MADNESS

up-to-date, institutions which at night had only one attendant for several hundred patients, and it is necessary in such cases as this to use restraint or to lock the patients up in single rooms where they cannot hurt themselves or others.

As medical people have come to know more about chemicals, they have substituted what has been known as chemical restraint for mechanical restraint, a pernicious tendency and one which now is being more and more disregarded. By chemical restraint, those of us who do not approve of this method mean the use of sedative drugs to such an extent that the patient is completely put to sleep. Since the sleep is not a natural one, it is not at all hard to understand why it would not be beneficial. Most of these drugs that we use even today are quite potent, and they serve to depress the nervous system to a marked extent. The newer drugs of this sort, of course, are not as dangerous to the heart and other organs as the older drugs used to be, but they are not beneficial. Many times the liver or the kidneys are upset so that the patient, in addition to the condition that makes him unbalanced, is suffering from a drug poisoning which makes it all the harder for him to gain his normal mental equilibrium.

Nevertheless, there is much more justification for the chemical restraint of a patient than for mechanical restraint. In the regular hospital we have never been averse to a prescription of a sedative at night if the patient cannot sleep, or is worried. Why then should we deprive mental patients of this solace?

The answer is, of course, that most often the mental patient requires such large doses of the drug and such continuous drugging that he never has a chance to see whether he is going to get well. A second danger which is often forgotten is the fact that an indifferent physician may substitute a drug for his personal care and attention. Because of his unfortunate

OFF WITH THEIR CHAINS!

attitude, when a patient becomes too annoying, such a doctor says "Give him a big dose of this and that dope" and then walks away.

But to return to the development of the hospital system: As late as the fifties of the last century, most mental hospitals in England and on the Continent were adaptations of prisons. Until Eighteen Hundred almost all the insane were kept in prisons. Real mental hospitals, as you already know, were the exception. A number of the prison techniques were carried over into the insane asylum, even after institutions were erected primarily for the care of the mentally sick.

One of the most pernicious, perhaps, yet one which did not have anything but the best of motives behind it, was the exercise yard. In the center of the hospital, or blocking off the open end of a U-shaped building, was a walled space where the patients were turned out for a certain number of hours during the day to get exercise. This is a common sight and a common practice in prisons of today. Where it is necessary that we be sure that no one escapes, as in a penal institution, there is a good excuse for keeping such people walled in and limiting the amount of grounds available for exercising. It is necessary that the keeper have an eye on all of them all of the time, and it was presumed that that would necessarily be the case also with the insane.

Once a small Scottish provincial asylum was having some repair work done, and it was necessary to tear down one of the walls of the exercise area. A debate occurred in the superintendent's office. Should he permit the patients to have their exercise, he asked, even though there was freedom where the wall had been? When he queried his staff, one or two of the younger men told him that it seemed to them to be not too great a risk.

"Perhaps," it was suggested, "you might put the patients

MEN AGAINST MADNESS

out in the yard, and we will call the whole staff out to watch them." Some of the more disturbed patients and those who seemed utterly unreasonable and dangerous were not permitted to enter the area that day. But strangely enough, even though the patients were not lectured about being "on their honor," nor urged to remain within the enclosure, there was no attempt made to get out. As a matter of fact, the patients took advantage of the open space to gambol and play and make the best of the situation, without any attempt to evade surveillance. It was obvious to the nameless superintendent of this institution that a great step forward had been made. He saw it was no longer necessary to keep the patients completely locked up as though they were in prison. If one were careful about which patients were allowed to leave the wards, it was quite possible to allow them to have their exercise and recreation in open yards.

Exercise and recreation had already been stressed by Conolly as one of the means of treatment. His reasoning was that if we insisted on fresh air and sunlight in our treatment of tuberculosis, they could be used in the treatment of mental diseases, which, after all, were not different from any other type of disease; and he urged that when patients did have exercise, when they did have fresh air, sunlight, and good food, they improved. It is our experience today that this type of treatment is as valuable as any other kind in aiding the mentally unsound to improve.

The same superintendent, when he saw how much pleasure a little open-air exercise gave to his patients, came to the conclusion that it would be a good idea to build walks around the grounds. Most asylums, then as now, were provided with extensive grounds. The patients were put to work improving these grounds and making walks, and it had a very beneficial effect upon them to be permitted to wander around without

OFF WITH THEIR CHAINS!

too much obvious watching, and to have a change of scenery as well as a sense of freedom.

If one were to inspect modern institutions today, I doubt whether he would be able to find a padded room in any of them. I know that in the years that I have been working with the insane, I have visited many hospitals without seeing such rooms. Perhaps the superintendents are a little ashamed if they have such equipment, but in my rather extensive trips through many of these hospitals it has never been my experience to be permitted to see these padded cells of the type that Conolly devised for the care of the obstreperous patients. Even the single rooms are now being done away with. Because of the fact that many hospital superintendents, even fairly recently, had not quite gotten the jail idea out of their heads, most asylums continued to be furnished with a large number of single rooms. They provided a good place for the patient to be when there was only one watchman for a large number of them; kept them from annoying other patients; and served as a disciplinary means.

We have seen that treatment, from a disciplinary standpoint, was early done away with, but, since it is a human characteristic not to be willing to face reality, the managers of the various institutions would not face the fact that these rooms were an evasion, permitting careless treatment of their patients, and also permitting discipline. But the managers' excuse was, that the rooms were necessary because patients needed seclusion. Open wards can really be used just about as successfully as single rooms. They permit of more activity, more supervision, more mutual incentive to recovery, and a good deal of social contact which the patient lacks if he has a room to himself. Since so many hospitals were provided with a number of cell-like rooms, a relic of the prison days, something had to be done with them, and in the older institutions

MEN AGAINST MADNESS

and the newer ones whose architects were not interested in modern psychiatry, there still are single rooms and the space has to be used. The most successful utilization of this space is to give these rooms to recuperating patients as a "reward." When a patient is recovering, wants some seclusion, and wants to get away from other patients for a little while, or when he is recovering from an illness and needs to be left alone, he can be given such a room as this and put to bed in just the same way he would be if he were in a private room in a hospital for physical disorders.

In the middle of the last century, still another project was undertaken. With the change of the institution from asylum to hospital, some superintendents had the idea that all patients should be kept in bed. If they were mentally sick, they should be treated as the physically sick. The reasoning was sound, but in practice it did not work out. The reason we keep the physically sick in bed is that rest is needed because the heart and life-preserving mechanisms in the body are being overstrained. This is not always the case with the insane. The mind is not necessarily fatigued. The heart and lungs may be doing their work without excessive strain, and if a patient who is physically sound be put to bed, he becomes so bored and so disgusted with the world and with his own thoughts that such treatment does far more harm than good. Today, of course, many patients still are kept in bed for sound reasons, particularly those who run a temperature or have an organic disease. They profit by the physical rest to a greater extent than they would profit by being allowed to move about freely.

The open-door system, another improvement, is being more and more used in European institutions, and to a certain extent we in the United States have adopted some of the precepts presented by its advocates. If one had gone into an in-



Plate XX

MEDICAL TREATMENT IN A MENTAL HOSPITAL.

Mental cases today are as thoroughly examined and as carefully treated as any other type of medical case.

Reproduced through the courtesy of Dr. Oris R. Yoder, Ypsilanti State Hospital

OFF WITH THEIR CHAINS!

sane asylum in the middle of the nineteenth century, he would have found that all the patients were locked in. Even those who were not locked in single rooms were locked in wards with several other patients. The idea behind this, of course, lies in the general public's dread of the insane. People generally do not realize, perhaps, that ninety-five out of a hundred insane are sick people and are comparatively harmless. The only danger which they offer to the public is the fact that they are unpredictable, that occasionally they have uncontrollable impulses to commit some offense, which, however, very often is not particularly serious. But the word "insane" unfortunately brings into the mind of the public a picture of a huge gorilla-like individual with teeth sticking out at various angles, matted hair hanging down before his face, claw-like hands, and a wild look in his eyes. I suppose there are some insane like this, but it has been my experience that, if they are kept properly groomed and under proper treatment, there isn't any case that needs to be in such condition, and I have never seen any in a decent hospital. Since the public has this idea, however, many of the more timorous hospital superintendents have been unwilling to take a chance and give the patients any freedom—they must be locked up.

Suppose you visited a relative in an American mental hospital. It is very likely that you would go to a desk in the main hall, state who you are, and obtain permission, without question, from the superintendent to visit. Before you get over to the ward the nurse has been telephoned. She meets you at the door. You probably never realize that that door has been kept locked before you came and possibly, as soon as you are far enough into the ward not to notice, the nurse locks it behind you. So the patients still live behind locked doors. They still feel as though they were criminals, and that they have lost their freedom. Those patients who have very little idea of the

MEN AGAINST MADNESS

fact that they are mentally ill, and unfortunately the sickest of the insane do not realize that they are unbalanced, are harmed immensely by what they feel to be the injustice of being locked in. As they improve, however, in most of the modern hospitals, they are allowed to pass freely into the grounds and as the superintendent becomes more reassured as to their future conduct and the likelihood that they are recovering, they are transferred into what is known as an "open" ward. These wards can not be distinguished in any way from wards in a general hospital.

In a hospital for the tuberculous, for instance, when a patient gets well enough to walk around, he is permitted to leave the ward, go outside in the sunlight and comport himself just as any ordinary individual would in an institutional environment. He need only obey the rules. The same is true in the open wards in the mental hospitals. And open wards were really not developed until about 1880. I do not know who it was who first started the open-ward system in hospitals. Apparently these wards arose simultaneously in many parts of the world, but now we find as many as fifty per cent or more patients in certain hospitals who are permitted to wander freely about the grounds and even, in many cases, to leave the grounds and go to the nearest village for shopping purposes or to attend moving-picture shows.

In the actual ward care of the patients there was a great deal of improvement after Conolly's time. Most of the attendants were huge "bruisers" who knew little about the care of mental patients. A strong arm and a weak mind were more useful than any knowledge of mental disease, and, naturally, except in the case of those few medical students who were working their way through college by attendance in mental institutions, one could not expect to have even a semi-trained personnel for the salaries which were paid. The Royal Medico-

OFF WITH THEIR CHAINS!

Psychological Association in England stood firmly behind a movement to train nurses and attendants, until now in England every attendant or nurse for the mentally sick must have a certificate of proficiency from that organization in order to practice.

In America, most of our large mental hospitals have training schools for nurses and their graduates are recognized to be competent to do general nursing. They take care of the physically sick in the mental hospitals; they also take care of the insane, but, since this experience offers very little in the way of study of childbirth or diseases of children and perhaps some similar specialties, those nurses who are trained in our modern American mental hospitals are permitted to supplement this training in affiliated general hospitals. I have heard it said by those who have compared graduates of good mental hospitals with graduates of general hospitals that there is very little difference in their attitude, training and ability.

Women nurses and attendants were early used in mental hospitals. We remember, of course, the sisters who were at work in Salpêtrière long before the turn of the nineteenth century. Taking into account the era during which they worked, they were undoubtedly the equivalent in training, attitude and ability of the trained nurses of today. But in English hospitals there was resistance to the use of women nurses in wards for men. In spite of the fact that women nurses are more sympathetic, more motherly, and give more of a hospital-attitude atmosphere to the mental hospital, this point was not appreciated because, perhaps, the superintendents had the same idea still common to laymen, that mentally sick men would be dangerous to women taking care of them.

In 1841 Dr. Hitch of Gloucester Asylum was the first whose activities are recorded in the matter of installing women as nurses in mental wards for men. He was aghast at

MEN AGAINST MADNESS

the fact that the attendants were so brutal to the patients under his care. No matter how hard he would try or how much he would lecture to his attendants, or how much he would urge a sympathetic attitude, the average ward looked something like a football field. An obstreperous patient would be tackled high and low by a couple of attendants and hustled off into seclusion. In order to counteract this, Dr. Hitch employed the wife of his ward supervisor. He took her aside and asked her whether she would not act in a general advisory capacity; whether she would not tend to the wants of the patients and see that they were given sympathetic treatment. She agreed, and the plan worked out remarkably well, so far as it went.

Real progress was made, however, about forty years ago when a Dr. Turnbull made the successful experiment of employing women in the hospital ward of the asylum, not as auxiliaries to the men attendants, but as nurses to take complete charge of the whole administration of the ward, which contained thirty male patients. A few years later, in another institution, the whole masculine department was placed under control of women nurses, who had only a few men attendants to help them. It was found that these women not only could control the men patients but were treated with the utmost respect by them. Where a patient would be obstreperous, profane, irritable and unreasoning with a masculine nurse or attendant, the same patient very often proved himself to be a perfect gentleman when he was taken in hand by a woman. One can see what an improvement having regular nurses on the ward would be. In my own experience I have learned that all wards in a mental hospital, as well as in an ordinary hospital, are much better run by women nurses.

I recall an incident on one occasion in the prison ward of Bellevue Hospital, New York City, when there were thirty

OFF WITH THEIR CHAINS!

men who were incarcerated, suspected of serious crimes or convicted of them, and who, in most cases, were suffering from comparatively severe mental disorders. This night, there was nobody in charge but a pretty nurse. She was sitting at her desk keeping records. She had made her rounds, had given medication to the patients, none of whom were restrained or tied into their beds, when suddenly one or two of the more sane who happened to be in the ward because of gunshot wounds rather than because of any mental condition, decided to try to make a "break." This ward at that time was in the old, not the modern, Bellevue Hospital. It was a sort of dungeon on the first floor, and there were two doors which had to be unlocked before an escape could be effected. Next to the doors was a cage. Sitting outside of this cage on this night, as on most occasions, were half a dozen superannuated policemen. When these two patients started to make their exit, the policemen rushed into their cage and locked themselves in for safekeeping, leaving the young woman entirely responsible for the care of these thirty, who were not only potentially homicidal individuals, but who were also insane. It took her very little time to soothe them and get them back into bed, and the jail break was much more easily thwarted than it could have been by the officers.

It was a sight to see the sheepish looks on those policemen's faces the next morning when they had to report that they had locked themselves away from the dangerous prisoners, leaving this tiny girl in complete charge of the ward!

Again and again one will see a patient rise up and shake his fist to threaten a man attendant or a physician, but calm down quickly when a woman nurse makes a few soothing remarks and jokes with him a little bit. All in all, one can scarcely keep from admitting that the whole atmosphere of the hospital for the insane has changed from that of a penal

MEN AGAINST MADNESS

institution as it was in the time of Pinel and Conolly to that of a modern institution with a tone which differs not at all in some respects, and very little in others, from the great general hospitals with which we are all so familiar.

If the layman could only learn how beautifully the majority of these institutions are managed, he would have much more confidence in the work that is being done in them so that, should the time come when he needs the assistance of such a hospital in dealing with a relative or friend, there would be much less suspicion on his part.



Plate XXI

DOROTHEA DIX

From a painting in the Trenton State Hospital, through the courtesy of Dr. Robert G. Stone

A WOMAN BEDEVILS THE POLITICIANS

WHILE a definite improvement was being made in the larger national institutions, and certain private institutions in France, England, and to some extent in Germany, the majority of the insane were still being cared for in a most reprehensible manner when, in 1841, Miss Dorothea Lynde Dix, a New England woman, laid before the Massachusetts General Assembly a memorial describing in most horrible detail the condition of the insane in jails and private institutions.

Dorothea Lynde Dix came from a most unusual background. Brought up with considerable strictness, and having had almost no natural childhood, she was fortified to go through life as one of the most trenchant yet kindly reformers that this country has ever had. The same terrific drive which sent Carrie Nation through the barrooms of the Middle West sent Dorothea Dix through the almshouses, jails, and private homes in which lunatics were being kept throughout the whole of the United States, and in many foreign nations as well. The tremendous drive for morality and reform which is so characteristic of her Puritan forebears seems to have culminated in Miss Dix in no uncertain degree. Her biographers paint her as a woman possessing great charm, a very pleasant smile, an extremely commanding voice, and a most graceful carriage. Certainly she was a master saleswoman, although

MEN AGAINST MADNESS

that term had not come into its present popular meaning in her day.

Her grandfather, who died when she was very young, was about as remarkable a person as she, and it may be from him that she acquired the dramatic personal traits which she manifested in such a marked degree. He was a pioneer in New England at the time when the cities were so close to the forest that the idea of having shade trees for decoration along the main streets seemed ludicrous. This idea which today is an accepted, even unremarked, civic policy, was first proposed by him, and in spite of the jibes of his fellow townsfolk, he insisted that trees be set up along the principal streets of his town. He was a persistent old codger, was extremely fixed in his belief.

Young Dorothea undoubtedly was in his home when, day after day, he came home and relieved his mind to his wife.

"I have presented the Selectmen again with the argument that we must have shade trees," he said to Dorothea's grandmother. "They are still laughing at me. The newspapers say I am foolish and headstrong, but I intend to persist, and I intend to see shade trees in the streets of our city." Eventually he won out. With the same degree of persistence he demanded that a main highway be laid out in Massachusetts. It was the forerunner of today's easy communication between the main centers of population.

With such a background from her grandfather, and under the discipline of a grandmother who was apparently the acme of meticulousness, it was naturally to be expected that Dorothea Lynde Dix would show some of these traits. About the grandmother, for instance, we learn that in her persistency to see that a small garment being sewed by a neighbor child was made correctly to the most minute stitch, she almost drove the child to distraction. And with Dorothea the case was similar. In fact, she was so imbued with the conscientious

A WOMAN BEDEVILS THE POLITICIANS

idea that she must lead a righteous and public-spirited life that when she was only in her middle teens she set up a school for impoverished children.

At an early age she began to show signs of a physical ailment which accompanied her throughout her long life. She had pulmonary hemorrhages and signs of pleurisy, and it was necessary for her to take a trip into a warm climate. While there, she kept an extensive and detailed diary, which again showed the exactness and punctiliousness of her nature, and which, on the other hand, revealed that she had an artistic and sweet interest in nature and in its beauty that she revealed over and over again. For one thing the United States has never had any dearth of reformers. It must be admitted that only too often these reformers are busybodies, nosy Anns and nuisances.

Dorothea Dix, on the other hand, was an honest, wholesome and energetic person. It is certainly true that her zeal sometimes outran what we today, looking back upon her escapades, might call good judgment, yet the sum-total of her activities was such as to make any biographer admit that her life was one of the most important in the history of the treatment of mental disease.

She early became known as an important person in her community, when she set up a school for girls in her grandparents' mansion, Dix House, and the youngsters whom she trained here never forgot the discipline that they learned. Any of my male readers who may have gone calling on a girl in a New England finishing school very likely can easily visualize the type of school teacher that Dorothea Dix was. How often has he been seated in a "parlor" waiting for his girl to come down, meanwhile being thoroughly investigated, first, by one of the mistresses, a solemn, rather sedate individual who looks as though she had a heart of granite, but whose heart very likely was velvet stuffed with a very fluffy grade of cotton.

MEN AGAINST MADNESS

While he is waiting for his date, he knows that another similar mistress is probably looking the girl over, tweaking her hair, rubbing off some of the rouge, and insisting perhaps that she should wash her ears the second time. But if he happened to marry that girl how fortunate he is. His wife probably has grace, a charming manner and a real housekeeping ability; and somehow or other she must have gotten it from these mistresses.

But Miss Dix' school teaching took a toll of her physically. Again she had pulmonary hemorrhages, so that it was necessary for her to take a trip to England in order to recuperate.

Upon her return to Massachusetts, at about thirty-three years of age, she had already established herself as something of an authority on discipline and had proved to the community that she was a woman of sterling qualities. A young theological student by the name of John T. G. Nichols was one of a group of young men assigned to the East Cambridge House of Correction to teach Sunday School to the inmates. When he found that he was to take charge of teaching the twenty female inmates of that institution, he lost his nerve. He must have been somewhat of a "sissy," because he went to his mother and asked her what he should do about the situation. His explanation, of course, was that the teaching of young females in Sunday School was not for him. (But if young theological students cannot teach young females Sunday School lessons I am wondering of what earthly value such students might be.) His mother thought that perhaps he was correct. She was an over-protective sort of parent, and it occurred to her that the strong-minded Miss Dix might be the person to consult, as indeed she was.

When Mr. Nichols, later Dr. Nichols, approached Dorothea and told her his problem, Miss Dix took the whole matter out of his hands, showing perhaps, as early as we have any record,

A WOMAN BEDEVILS THE POLITICIANS

some of the traits which later on were to flower into a dominant personality. She said that she would go to the House of Correction and take charge of the Sunday School teaching. When she went there, she was appalled and aghast at what she found. Not only were the prisoners being mistreated and neglected, but she found that there were some insane there. Going home to muse over the subject, she determined to look further into the matter, and in the course of a few months visited one jail after another until eventually she had collected enough material so that she could present her very imposing memorial to the Legislature of Massachusetts.

In spite of the natural callousness and crudity of a generation which did not yet have bathtubs, gas stoves or electric lights, the amazing and shocking condition of the insane in these county institutions was enough to attract statewide and even nation-wide attention. Naturally Miss Dix was attacked by the press and by self-sufficient persons. The conditions, they claimed, which she described could not exist. Here was a female who was going to "raise Ned" and was going to spend the taxpayers' money. But Miss Dix not only was a very determined person—she was undoubtedly quite a smart one. She had her evidence so carefully arranged that there was almost no arguing with her. Time and time again when she proposed to put some of her measures through the Legislature she was so forearmed with her facts that the only debate that could be held was covered with camouflage and did not directly attack the issue which she brought up.

It is perhaps fortunate today that we have none of the conditions which she found. Even to read about some of the cases that she cites in her original memorial is enough to disgust thoroughly any reader, to make him ashamed of being a human being. After visiting the almshouse at Danvers, she called attention to the fact that, while the building was large, it was

MEN AGAINST MADNESS

much out of repair, and that there were some fifty to sixty inmates, including one idiot and three insane. As Miss Dix approached the building, according to her account, she heard wild shouts, snatches of obscene songs, foul, lascivious and ungodly language, and since at that time Miss Dix was not yet used to hearing sounds of that kind she was seriously shocked.

The first individual whom she saw was a young woman who had been a respectable person, industrious and worthy, but who had had a number of disappointments and troubles so that her mind had been shaken. When the authorities realized that fact, she was placed in the Worcester State Hospital for a considerable time. At that hospital she was considered incurable and consequently was returned to her home county institution for custody, as was the custom. There a complete change in her character resulted. When she had been at Worcester she had acted like a law-abiding person, was fairly clean, and did not use profane language—Miss Dix calls her “decent”—but when Miss Dix saw her she was beating upon the bars of her tiny cell, covered with filth, with naked arms and disheveled hair. The only clothes she wore were foul-smelling and torn to pieces, and Miss Dix remarks that the air was so offensive in spite of the fact that there was ventilation on all sides except one, that she could only remain a few minutes in that atmosphere. The girl’s body was covered with filth and there was a skin eruption caused by it.

But the investigator pointed out that there were many other cases similar to this, and demanded that something be done about them. Naturally, the reaction that she received first from the powers-that-were took the form of the question: since these people are completely out of their minds, what can he do? Must they not just be allowed to lie in small cells away from everybody else to rot? Must they not be chained because they are dangerous? And Miss Dix an-

A WOMAN BEDEVILS THE POLITICIANS

sswered in her memorial that that should not necessarily be the case.

Again, she tells about a young woman, a ward of a small local almshouse, who was a raving maniac. She had been disciplined with chains and whipping. She had been kept in a cage, sworn at, and abused. It was the custom in those days to put up paupers for sale, an amazing procedure and one which has been soft-pedaled in our American histories. Even historians whom I have consulted on the matter are only vaguely aware of the fact that there was such a custom as auctioning off a live, white human being in such an enlightened state as Massachusetts less than a century ago. Miss Dix' mad woman, since she appeared to be worthless as a servant, was necessarily put up for auction again and again with no success. Finally, one day, an old man decided to buy her. He was asked what use on earth such a woman as this could be to him, and he replied that his wife wanted her, and he intended to buy her. Taking her home, he lengthened her chains and gave her a chance to sit with the family. Together, he and his wife cleaned her up and dressed her decently, and it was not long before she became quite a sociable, friendly, and not entirely irrational person. It was soon possible to do completely away with her chains, and she became like a member of the family. Miss Dix in all honesty admits that the girl did not completely recover, but she was considered safe and was no burden to these old people at all—in fact, was useful to have around the house.

When arguments such as these, which she brought from almost every part of Massachusetts, were presented to the Legislature, Miss Dix set up a considerable stir. But like all reformers who have been successful in this country, she found enough people of similar mind and of sufficient importance so that her feelings on the subject bore considerable political weight. As a matter of fact, some of her adherents later on

MEN AGAINST MADNESS

became among the most influential people in New England: Samuel G. Howe, William E. Channing, Horace Mann, and Luther B. Bell. These men and others of dignity and importance in later life, who were even at that time in a position to aid her, formed an interference before her so that she could commence her moral touchdown against the team of ignorance and indifference. Oliver Wendell Holmes in his "Autocrat of the Breakfast Table," remarked, apropos of Miss Dix, that there were social conditions which were never realized, and which were amazingly shocking when they came to light. He likened the situation in the insane asylums to the condition sometimes found under a flat rock which is lifted up. Beneath the surface of this rock are matted grasses, weeds, and a variety of hideous, disgusting little creatures.

Soon the whole community was becoming more and more agitated for Miss Dix' reforms. Because of the strong nature of her friendships, and the fact that the community was already ripe for reform in the care of the insane, it was no longer necessary for her to do very much political campaigning in Massachusetts. All she had to do was to investigate, write down her facts, and recite them. They could not be denied, and the wholesome spirit of her neighbors was enough to move them to insist that something be done about remedying those things she had exposed. In 1843, the Massachusetts Legislature passed a bill providing for adequate hospitalization of the insane. She had drawn first blood!

The reforming fever, however, had gotten into Miss Dix. Massachusetts had been started along the right road, but there was more to be done. Conditions in Connecticut and Rhode Island could certainly be no different than those in Massachusetts—the call had come and it must be answered. Miss Dix already showed signs of being a shrewd political operator. She knew that if too much was said about her personally she would

A WOMAN BEDEVILS THE POLITICIANS

be considered merely a meddler. People would say: "Oh, dear, here she comes again." As much as possible she kept herself in the background, but in a Providence newspaper appeared an article containing a description of some of the conditions which she had found in Rhode Island. To quote in part:

" 'Your other patient—where is he?'

" 'You shall see; but stay outside until I get a lantern.'

"Accustomed to exploring cells and dungeons in the basement and cellars of poor houses and prisons, I concluded that the insane man spoken of was confined in some such dark, damp retreat. Weary and depressed, I leaned against an iron door which closed the full entrance to a single stone structure, much resembling a tomb; yet its use in the court yard of the poor house was not apparent. Soon low, smothered groans and moans reached me, as if from the buried alive. At this moment the mistress advanced with keys and a lantern.

" 'He's here,' she said, unlocking the strong solid iron door. A step down, and a short turn, through a narrow passage to the right, brought us, after a few steps, to a second iron door parallel to the first, and equally solid. In like manner, this was unlocked and opened; but so terribly noxious was the poisonous air that immediately pervaded the passage, that a considerable time elapsed before I was able to return and remain long enough to investigate this horrible den. Language is too weak to convey an idea of the scene presented. The candle was remote from the scene and its flickering rays partly illuminated a spectacle never to be forgotten. The place, enclosed, had no source of light or of ventilation. It was about seven feet by seven, and six and a half. All, even the roof, was of stone. An iron frame, interlaced with rope, was the sole furniture. The place was filthy and damp . . . ; and the inmate, the crazy man, the helpless and dependent creature, cast by the will of Providence on the care and sympathies of his fellow

MEN AGAINST MADNESS

man—there he stood, near the door, motionless and silent—his tangled hair fell about his shoulders . . . ; he was emaciated to a shadow, etiolated, and more resembled a disinterred corpse than any living creature. Never have I looked upon an object so pitiable, so woe-struck, so imaging despair. I took his hands and endeavored to warm them by gentle friction. I spoke to him of . . . liberty, of care and of kindness. Notwithstanding the assertions of the mistress that he would kill me, I persevered. Tears stole over the hollow cheek, but no words answered to my importunities; no other movement indicated consciousness, perception or sensibility. Moving a little forward, I struck against something which returned a short metallic sound; it was a length of ox-chain, connected to an iron ring which encircled a leg of the insane man. At one extremity it was joined to what is termed a solid chain, namely, bars of iron eighteen inches or two feet long, linked together, and in one end connected by a staple to the rock overhead.

" 'My husband,' said the mistress, 'in winter rakes out sometimes, of a morning, half a bushel of frost, and yet he never freezes'; referring to the oppressed and stricken maniac before us.

" 'Sometimes he screams dreadfully,' she added, 'and that is the reason we have the double wall, and the two doors in place of one; because he disturbed us in the house.'

" 'How long has he been here?'

" 'Oh, above three years; but then he was kept a long time in a cage first; but once he broke his chains and the bars, and escaped; so we had this built, where he can't get out.' Get out! No indeed; as well might the very dead break through the steel grates of the tomb.'

It was about this time that Miss Dix showed her extreme competence as a saleswoman. One of the most close-fisted men

A WOMAN BEDEVILS THE POLITICIANS

in Providence was a man named Cyrus Butler. He had amassed considerable wealth—as a matter of fact, he left some forty million dollars when he died—and in amassing that wealth he had learned what all rich men eventually are able to learn, that there are certain ways of evading the sponger and the charity collector. When Miss Dix made up her mind that something had to be done in Providence, that some sort of institution had to be set up to care for the insane immediately, and that it was not a matter of going to any legislative body, she made a list of wealthy people, and on this list was Mr. Butler. In spite of the dissuading efforts of her friends, in spite of the fact that almost everybody laughed at her, assuring her that Cyrus Butler was one of the hardest men to crack in the community, she asked a friend of hers, a Reverend Edward Hall, to introduce her to Mr. Butler.

She made her way into Mr. Butler's office and with the Dix charm was able to steer him off his usual wearing-down tactics of discussing the weather and trivialities, and confronted him with her proposition just like a modern high-pressure salesman closing a deal. After telling him what conditions were, and what she expected of him, she said in effect, "Take it or leave it."

"Mr. Butler," she said, "I wish you to hear what I have to say. I want to bring before you certain facts, involving terrible suffering to your fellow creatures all around you, suffering you can relieve. My duty will end when I have done this, and with you then will rest the responsibility." She then told her story and started to walk out of the place.

"Miss Dix," asked Butler before she left, "what do you want me to do?"

"Sir, I want you to give fifty thousand dollars toward the enlargement of the insane hospital in this city."

"Madame, I will do it."

MEN AGAINST MADNESS

If Mr. Butler was as hard a nut to crack, as he certainly is accounted to have been, Miss Dix had extraordinarily winning ways. It can not be denied that her proposition was one which deserved consideration from any decent humane individual, and it is likely that a woman as shrewd as Dorothea Dix had fairly thoroughly prepared the way through mutual friends and other sources so that Mr. Butler would have been in a receptive mood. Nevertheless she did get what she wanted, in one interview. Before Butler died he gave much more money to this institution which later became Butler Hospital, today one of America's leading mental institutions.

Millions of people would have been satisfied to be the inaugurator of the reformation which was going on in the New England states, many would have said to themselves: "I have shown them what is the matter, and I have shown them how to go about changing it, now let them go on from here." But not Dorothea Dix.

That same demand for perfection, which, on the part of her grandmother had made her childhood so unhappy, had by this time, been firmly rooted in her personality. It was no more possible for her to stop after completing her reforming work in New England than to put down an unfinished piece of embroidery.

Geographically Miss Dix' next point of interest should have been New York, but somehow or other she seems to have skipped that state. Instead she threw herself, heart and soul, into the reformation of New Jersey, going there in the "forties" of the last century. I rather suspect the reason why she did not attack the problem of the State of New York was that she was a shrewd enough politician to realize that there was a state legislature which would require of her more prestige, in order to do any good, than she had yet got for herself. New York then was a hidebound state, and perhaps still is in

A WOMAN BEDEVILS THE POLITICIANS

many ways, although in its legislation it very often leads the way for other states today. But in those days, because of its size and the differences in the types of people—because of the fact, too, that communication was not so rapid—it was a very difficult state to organize politically for general reform. Dorothea Dix was a spinster; all the love that she might have lavished on children was lavished on this project of hers, and it would have been highly foolish for her to undertake the reorganization of institutions in some states where she might not have won her battle, particularly in the early years of her career. It is probable, too, that she knew that New York had already set up two or three rather excellent public institutions, and was well on the way toward mending its ways. Perhaps New York had acquired some inspiration from Miss Dix, but we have no record of this.

New Jersey was without any state hospital; the insane were still being kept in county jails, private homes, and the basements of public buildings. On January 3, 1845, she presented a memorial to the legislature in New Jersey. By this time she had become far more alert to the pitfalls of politics, and had modified to some extent her natural tendencies merely to do the right thing without considering the method, so that not only did she do the right thing but she did it in the right way. Before presenting this memorial she laid her ground work. She interviewed a great many people throughout the state, became acquainted with many of the legislators, and, smart woman that she was, made it a point to know the legislators' families.

The story is told, for instance, how in North Carolina she found out that one of the legislators, a Mr. Dobbin, was worrying about his sick wife. Miss Dix, who at that time was trying to establish better institutions in that state, set out for the Dobbin home and nursed Mrs. Dobbin until her dying day.

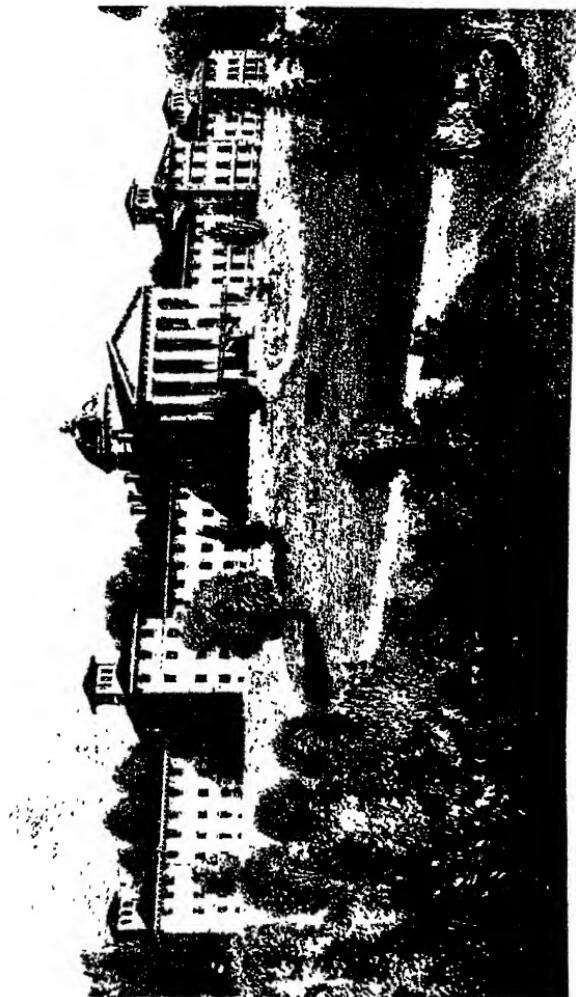
MEN AGAINST MADNESS

Mrs. Dobbin made her husband promise that he would support Miss Dix' project and do everything possible to further it.

In New Jersey Miss Dix used the same technique. Perhaps she was not quite as alert in predicting potentialities as she might have been, but almost instinctively, perhaps, she knew what the right thing was for her to do when a situation arose. Was there a sick child in a legislator's home? If so, she was there with advice and aid. Was there a sick wife? Then she nursed her. And by the time that the memorial had come to the State House at Trenton, she already had a coterie of firm supporters. Her biographer, Francis Tiffany, points out that Dorothea Dix had two traits which were uncanny; one was an excellent ability to judge the people with whom she could work, and how to handle the others; and the second was a knack of doing the right thing at the right time. Whether these two abilities hark back to her early discipline we are unable to say, but, whatever the foundation for them, they served her in no poor stead.

By the time she had come to New Jersey she had learned the art of lobbying. In her New Jersey memorial she shows that her mind had been modified somewhat by what she had learned in New England. This memorial was not just a "blurb" telling how bad things were; it was not just an essay; but it *was* one of these heart-throb and horror compositions which we seldom see nowadays. The Massachusetts Memorial was a layman's petition; the New Jersey Memorial was a sort of Louise Alcott composition. Mingled with tears, there were groans, and vice versa. She not only presented cases to horrify, as she did in Massachusetts, but she also added a few cases which had a tender story, telling how, for instance, one case, an elderly jurist who had had a very wonderful reputation in the community, was found stricken and neglected in his home.

Plate XXII



THE TRENTON STATE HOSPITAL
Dorothea Dix's "first born child."
Through the courtesy of Dr. Robert G. Stone

A WOMAN BEDEVILS THE POLITICIANS

If she were living today, we probably should say that she was an artist in the human-interest technique, and possibly we might label her a sob-sister, although her personality was certainly different from that of most ladies of the press. She used every possible technique in forcing her bills through. She would write letters, editorials, and stories for the local newspapers. She would correspond with, and see, every important individual who she thought might be susceptible to her salesmanship. She even spent evenings with legislators. There is no doubt that many of them were afraid of her, but, on the other hand, they were equally afraid of their constituents. Dorothea Dix was against the same proposition in all these states that public-spirited citizens oppose today. Her legislators, and we find them characteristically in the New Jersey group, were afraid partly to spend public money, and afraid partly because the voters are apt to consider that their liberty is infringed upon on some occasions when the state does something for them.

In spite of the fact that the public undoubtedly gets more for a tax dollar than it does for any other dollar spent (except perhaps for foodstuffs in time of depression), there is no real recognition of that fact. Because the tax bill comes in, whether they like it or not, because they cannot voluntarily economize on it, and because the assessor has a hardened, matter-of-fact point of view, the American voters begrudge financial support of their government. Our population does a lot of talking and unfortunately not as much thinking, so that when a person like Dorothea Dix comes in sight with a very proper project for the state, but one which costs money, immediately there is a hue and cry. Every dollar must be accounted for, and the more stupid people in the community, who cannot see that civilization is far more important than their own pocketbooks, will threaten the conscientious legis-

MEN AGAINST MADNESS

lator with a campaign against him at the next election. Again and again, particularly in the New Jersey campaign, when Miss Dix had not yet built up a reputation for herself, legislators would get up and ask why so much money should be spent, and would refuse to appropriate the money even though the principle might seem to be good.

One member of the legislature even went so far as to say that Miss Dix' plan looked to him very much as though she were trying to saddle the state of New Jersey with an unredeemable debt. He said sarcastically, that perhaps it was lucky that she steered clear of the national debt. He maintained that it would be better to spend that money for building schools than for treating the insane. In like manner today, perhaps, we advocate spending money for preventive clinics rather than for insane asylums, even though it is easier to get the money for the latter. This member advocated paying Miss Dix five or six hundred dollars to escort her out of the state, and said that he would be willing even to raise the ante to a thousand dollars to enshrine her in the White House, just so as to get her away from New Jersey. Miss Dix was not complimented by the speech, although she should have been. She finally mustered enough votes so that she could put through a bill setting up the New Jersey State Hospital at Trenton.

New Jersey was one of the few states in which she remained during the whole period of the legislative battle. Usually when she had done enough spade work she took herself somewhere else and started another project, leaving the actual pushing through of her bill in the hands of experienced legislators. She would build up enough public pressure, educate the newspapers sufficiently, and line up enough legislators through her newspaper publicity or by means of her friends, so that she no longer needed to be on the scene. This, perhaps more than some

A WOMAN BEDEVILS THE POLITICIANS

of the other traits she showed, is a sign of her being an astute politician, for certainly she would have turned at least a few of the legislators against her because of her persistence, had she remained on the ground.

During the next few years she traveled thousands of miles and set up hospitals in the South, where there had been none before. She went to Illinois, Indiana, and Kentucky, even as far west as Missouri. One must remember that these states were backwoods states, the time being twenty years before the Civil War, and transportation was hardly developed. She had to travel thousands of miles on horseback, in coaches, and on little Mississippi River boats. She stayed in backwoods settlements, and rode behind primitive white and Negro drivers over mud roads which were only slightly corduroyed.

She was so set on doing her duty that it was nothing for her to go out completely equipped for such a journey. Because her wagon broke down so frequently and she was forced to dismount in deep mud in drenching rain only to find that her driver was without the simplest means of repairing the damage, she carried with her a hammer, wrench, nails, screws, a cord of rope, and straps of saddle leather, which on many occasions served to put things right. Undoubtedly had she been able to carry them with her she would have liked to carry extra wheels and springs, because these parts often broke on the foul roads over which she rode.

In her letters we find brief remarks about some of the problems with which she had to contend. She told, in one letter, about being stuck on a mud bar near Vicksburg. One physician said that her constitution was continually steeped in malarial fever, and this in addition to the fact that she had been, as we note earlier, a sufferer from a pulmonary condition since a very early age. But Miss Dix was fearless. Even though men

MEN AGAINST MADNESS

who were traveling in that perilous country seldom went out alone, Miss Dix had no retinue. She was completely unarmed. On one occasion she was interviewed and asked whether she was afraid to travel through the country by herself unarmed, and she said yes, that she was naturally timid, but that she felt that she should do everything possible to carry out her purpose.

"I am naturally timid and diffident like all of my sex," she said, "but in order to carry out my purposes I know that it is necessary to make sacrifices and encounter dangers. It is true, I have been, in my travels through the different states, in perilous situations. I will mention one which occurred in the State of Michigan.* I had hired a carriage and driver to convey me some distance through an uninhabited portion of the country. After starting, I discovered that the driver, a young lad, had a pair of pistols with him. Inquiring what he was doing with arms, he said he carried them to protect us, as he had heard that robberies had been committed on our roads. I said to him, 'Give me the pistols,—I will take care of them.' He did so reluctantly. And pursuing our journey through a dismal-looking forest, a man rushed into the road, caught the horse by the bridle and demanded my purse. I said to him with as much self-possession as I could command, 'Are you not ashamed to rob a woman?'"

Miss Dix goes on from here to explain that she discussed the matter with the robber, who, hearing her voice, realized who she was, and apologized. Sometimes in reading accounts of Miss Dix' life, one gets the idea that she was only an astute Puritan who was "riding a hobby" and was not, perhaps, herself entirely sane, but the end of this episode makes one feel otherwise. When the man recognized her voice and said that he knew her and that he wouldn't take any of her money at all,

* Where this is being written!—Author.

A WOMAN BEDEVILS THE POLITICIANS

she forced some on him, her explanation being that perhaps he might be tempted to rob somebody else before he could get honest employment.

Truly, not only in her handling of the insane, but in her handling of this criminal she showed a masterful ability to study human nature and to understand the causes of extraordinary behavior. It is unfortunate that people today who have to deal with crime do not always understand human nature sufficiently to use such principles as Miss Dix did in this instance. If people would put themselves out to aid a criminal, would treat him like a human being, many of our other problems, besides the problems of the insane, might be better on their way to correction.

In addition to carrying the legislatures of Illinois, Indiana, Kentucky, Tennessee, Missouri, Mississippi, Louisiana, Alabama, South Carolina, North Carolina, and Maryland, Miss Dix established new asylums in some of the British Provinces, Halifax, St. Johns, and a part of Canada, then known as Canada West, and now known as Ontario. When she went into the South, she dealt primarily with Democrats. She knew that the South was soundly Democratic, even in those days. She wasted no time on the weak opposition party. In 1849 she put in a winter of earnest working on the Alabama State Legislature—and just as she was about to get her bill passed, the State House caught fire. Immediately there was a demand for retrenchment, money must be saved, the State House must be rebuilt, and Miss Dix' bill was lost, but not permanently. Even though she did not come back to lobby, she had set off enough dynamite to wake up the usually dull state medical organizations so that the Alabama State Medical Association appointed a special committee, which finally put her bill through during the Session of 1851-52.

Miss Dix had now become a national figure. Everyone knew

MEN AGAINST MADNESS

of her work, even though she was personally extremely modest. We must admit, of course, that this modesty was the modesty of the person who knows that she is doing well a piece of work, who is subconsciously interested in getting a feeling of tremendous power from it, but there is no doubt on the other hand that Miss Dix was a heroic person, and, except for a few selfish critics, she was receiving well merited praise. She had had no failures to speak of, and when she had lost out in one year, like a good politician she was willing to wait for the next or even a second or third year to make good her loss. Eventually she got what she wanted. This record of success certainly must have had a good effect upon her own self-assurance, although we have never been told that she lacked any. It gave her supporters and those who were interested in her work the feeling of "backing a winning team." They were willing to stand behind her when she had another project. She was smart enough and experienced enough never to present a project unless it had a reasonable chance of going through, and she selected those states where each victory would accumulate on top of those which had gone before, in order to make it possible for her to go on to the next which might be a little bit harder.

In 1850 Miss Dix requested from Congress the appropriation of some five million acres of the public domain for the use of the insane, and also for the use of the blind and the infirm. Later, apparently upon very good advice, she raised the amount of her request to over twelve million such acres. The amount of public domain to be turned over for this purpose was about the size of a third of England, including Wales.

During her campaign, Miss Dix was given an alcove in the Congressional Library. She rose at four or five in the morning and prayed for about the first hour. After breakfast at eight o'clock, she took care of all her correspondence; it was a cus-

A WOMAN BEDEVILS THE POLITICIANS

tom of hers never to let any of it lapse. The reason for this strict regime was her poor health. She did not dare allow herself to get behind on each day's work, for fear it would become too great for her strength in a short period of time. At ten o'clock she would be seated in her chair in the alcove, when for four or five hours at a stretch, even during the hot weather of July and August in Washington—which at that time of the year has been compared to the Tropics at their worst—she would deal with all the problems of the insane in the twenty or more states in which she had worked.

She would often call upon a Congressman or a Senator who seemed to be wavering in regard to her bill. And she possessed the ability to maintain a vital and adequate appeal to each one of them. Seldom did a Senator or Congressman on the wrong side of the fence come to her but that he would climb over to line up with her before she was through talking. This amazing persuasiveness seems to have been unique with her, unless the legislative breed of those days was different from that of today and did not need much persuasion, and there is no reason to believe that this was the case.

Yet she did not use rhetoric—she spoke well, it is true, and her English was beautiful, as one would expect from a New England schoolma'am. She could bring a man to tears more quickly, according to her biographer, than any other person he had known, and when she was through, a hard-boiled legislator would feel that it was his duty to carry out her wishes. America should be proud that a master saleswoman of this type should have devoted her life to charitable projects, for certainly she would have been a master at anything else she might have wanted to take up. It is true that she was so imbued with her spirit of reform and her desire to be helpful that she could be nothing but inspiring when talking about her favorite theme.

MEN AGAINST MADNESS

But national politics were different from state politics, the amount of money involved in individual states never compared with the amount involved in national problems, and it was three sessions before Miss Dix got her bill through, only to be vetoed by President Pierce, in spite of the fact that he claimed to be fully in sympathy with her aims. Pierce, one of our less adequate presidents, was not so very astute: he used a quibbling question of the constitutionality of the bill as an excuse to veto it, even though similar bills giving land to railroads, with a purely pecuniary motivation, had gone through, and even though it was not the President's job to decide whether or not an Act of Congress was constitutional. One can see that in those days there was the same problem in this country that there is today, when anyone is trying to put forward up-to-date welfare procedures.

Whether it was because Miss Dix was a shrewd enough politician to realize that she had best give the country a rest after her defeat in Congress, or whether among her virtues she possessed the ability to take a loss philosophically, her historians do not seem to know. At any rate, she ceased her activities in this country for a while. The usual reason given was that Miss Dix, not being a strong woman, was forced to take a rest. That may be a rationalization, or at least partly one, but it is undoubtedly true that her ten years of traveling about the country through swamps, across prairies, and through the most unhealthful districts, on the go day and night, must certainly have taken a tremendous physical toll.

So Miss Dix went to England, where she visited the Tuke family during old Dr. Tuke's last illness. It was he who had first set up the York Retreat using in England, for the first time, the non-restraint method. Then Miss Dix went to Scotland. When she showed up on the horizon, she gained the nickname of the "American Invader." Had she been a man,

A WOMAN BEDEVILS THE POLITICIANS

and had she been less appealing personally, she would probably have been ignored, or at least refused any official contacts. I consider it extremely doubtful whether, under such conditions, the political techniques that she learned on this side of the ocean would have been of any avail in the more sophisticated British Isles.

But being a woman, being personally tremendously interesting, and having an immense urge to improve conditions in institutions for the insane, she finally gained admittance into all the county jails, private insane houses, and other places where she wished to go. But she was by no means welcome, even though the authorities put on a superficial appearance of co-operativeness. Finally she reached a place where she was so horrified by conditions where restraint was being used most viciously, and where the insane were being completely neglected, that she felt it necessary to go to the Lord Provost of Edinburgh.

This official, had he wished, could have reorganized all the institutions in Scotland in such a way as to please Miss Dix, and at the same time to help the insane. But he had already built up in his own mind a resistance toward her. He had known that "this meddling woman" would sooner or later show up in his precinct, and he was ready for her. He had only one answer to her demands, and that was that he had no authority to make any of the changes which she suggested; power to make such changes lay entirely in the hands of the Home Secretary, in London. It is doubtful whether a Scotchman under ordinary conditions will admit that he has no authority to remedy conditions in Scotland and that such matters lie with an Englishman, unless he wants to use the Englishman as a cat's paw to pull his chestnuts out of the fire.

This must undoubtedly have been the case in the early fifties of the last century, when Miss Dix showed signs of undertak-

MEN AGAINST MADNESS

ing the clean-up of Scotland. After thinking the matter over for a short time, the Provost decided that Miss Dix was the sort of person who would immediately go to London to see Lord Grey, the Home Secretary. So he ordered his servants to pack his trunk and announced that he would take a day train the next day. But Miss Dix was fearless and had an uncanny knack of knowing the right thing to do. So, no sooner had she reached the sidewalk outside the office of the Lord Provost than she decided that she had better get right down to London. She felt rather sick, but instead of waiting for the day train the next day when she could have ridden in comfort, she took the night train—and she reached London in plenty of time before her Scotch rival.

Lord Shaftesbury, who was one of Conolly's firmest supporters, took her in hand at once and arranged for her to meet the most influential people in England. They, in turn, put pressure upon Lord Grey, the Home Minister, to give her an interview. The upshot was that she accomplished more by way of reform in Scotland than she had accomplished in any State in the Union. Not only was a Commission set up to investigate conditions in the institutions, but it was also empowered to change the sanity laws, and this was indeed done. The Royal Commission itself, however, could not have produced its results had Miss Dix not returned to Scotland, where her experience in tracking down violations of the law and unsavory conditions served her in good stead. Miss Dix' handling of this problem, even though it was in a foreign country, was just as competent as it had been when she was dealing with the same sort of thing in America.

Naturally, it is not generally to be expected that a visitor can be either as aggressive, or even perhaps as desirous of bringing about reforms in another country as he is in his own. Miss Dix, however, in all probability was just as conscientious and

A WOMAN BEDEVILS THE POLITICIANS

just as anxious to aid the insane throughout Europe and Asia as she was to take their part in her own country, but she did her best work in the British Isles where she was almost adopted as a native, so well had she integrated herself with the life of England and Scotland.

She continued her travels, first going to Paris, where one finds, perhaps, a little bit more of the spirit of picayune criticism than one might have noticed previously in her work. There was no longer the opportunity for her to get ego-satisfaction, to feel that she was doing great things by reforming, for Paris, after all, and many other parts of France had had the influence of Pinel and Esquirol. There was no need of much severe criticism. About all that she was able to say against the Parisian institutions was that the personnel was not all that it should be, and there was some criticism of ventilation. But these were minor details, only reported because Miss Dix, having established herself in her own mind, as well as in the mind of the public, as an authority, had to find fault and suggest changes in order to keep up her reputation. It is quite likely that a disinterested observer could have gone into American institutions set up under Miss Dix' own guidance and found deficiencies even worse than those that Miss Dix found in France.

Miss Dix' reforming career, however, was by no means terminated after her Scottish episode. She went to Rome and there she discovered, according to letters which she sent to her friends in America, a situation which could not be found in any other civilized country. Under the very walls of the Vatican, in the City of Rome, where there were thousands of souls who had dedicated their lives to the uplift of humanity and the principles of Christian living, she found the local mental hospital, more or less directly under the aegis of the Pope, in the most terrible condition. It was almost a shambles. Pa-

MEN AGAINST MADNESS

tients were still chained, in spite of the fact that non-restraint had been in vogue for fifty years in France. Although that country was only a few hundred miles away, modern treatment had not percolated into Italy. She found a similar situation in Florence. But she was more ready to apologize for the Florentines, for the Duchy had only recently been the battle-ground of many conquering armies, and a picnic ground for many conquering tax collectors. She realized that it would be almost impossible for the Florentines to provide the funds, even though they might be willing to reform their asylums.

In Rome, such arguments were not valid. There were plenty of funds available, and the administrators of the whole hospital system, from the Pope down, had made solemn pledges to do the best they could for humanity. Instead of that, the institutions were bad beyond description. In her shrewd, astute way Miss Dix approached Pope Pius IX. Anyone who had been able to deal satisfactorily with an American legislature in the middle of the last century ought to have found European politics and church politics child's play, for the European diplomats, although shrewd with a heritage of many centuries of sharp dealing behind them, could not compare in unpredictability with the behavior of the untrained, prejudiced, and ignorant American legislator. How Miss Dix became so well acquainted with Cardinal Antonelli, I am unable to find out, but at any rate, she was able to join to her long list of able and aggressive co-operators this Prince of the Church.

Antonelli and other friends arranged for her visit to the Vatican and made sure that she met Pope Pius IX in a private hearing. After she had told him of the conditions which she had found, he assured her that he would look into the situation. No executive likes to have an employee of a competing firm tell him where his plant is inefficient, and some of these

A WOMAN BEDEVILS THE POLITICIANS

feelings must have been present in the Pope when he heard Miss Dix, a Protestant and a foreigner, describe to him the frightful condition of Italian hospitals for the insane, and draw for him by way of contrast a picture of the way the insane were being treated in England and the United States.

The Pope "stalled." He told Miss Dix that he would look into the matter and instructed her to return at another time. From her vast experience with executives, Miss Dix realized that there was great likelihood that her representations would be passed over, and that nothing would be done. In one of her letters to a friend, she remarked with some pessimism that the likelihood that she would accomplish very much was not great, but that she did have hopes that, because she was an outsider looking in, the pride of the Catholic authorities would be sufficiently injured so that something would be done. She planned to remain in Rome until she got results.

But, unknown to her, in the interim between the two interviews which the Pope granted to Miss Dix, he betook himself to the institution and saw with his own eyes that what Miss Dix had represented was true. When she returned, he assured her that something would be done, and she left the second interview with more assurance. She did plan to stay in Rome to see that something be done.

But here there was no such thing as bringing popular pressure to bear. She did not know the language; she knew no way of handling the newspapers and, even if she had, it is extremely doubtful that the press or public sentiment would have sided with her against the Pontiff. All she could do was wait.

Much to her surprise, perhaps because she was used to dealing with dilatory American politicians, she soon heard that a physician had been sent to Paris to study methods of treating the insane, and that land had been purchased for a new insti-

MEN AGAINST MADNESS

tution. It was not long before this institution was operating with a full quota of beds and personnel. Friends of Miss Dix who visited it in later years reported to her that no criticism could be laid against it.

Miss Dix had heard of the vile conditions in the institutions for treating the insane in the Near East. Constantinople particularly had a terrible reputation. Until the late Turkish dictator, Kemal Pasha, took the city in hand, it was known as a foul, dirty and unsanitary metropolis. Even at the beginning of the present century, many modern facilities had not been made available for its citizens, and the average Turk was said to have an odor about him so strong that even a goat preferred not to be in his vicinity. All this unpleasantness failed to deter Miss Dix.

She turned her eyes Constantinople-ward and soon arrived on the scene, bag and baggage. There she had no trouble securing admission to the local insane institutions but, to her surprise, the English prison was in much worse shape than most of the institutions which she found in Turkey. In this prison, too, she received a worse rebuff from the medical director than she suffered in any other place in the Near East. Except for a few minor suggestions, she had nothing to say about the local insane asylum. A young Turk had visited Paris, and, while there, had become interested in the condition of the insane. Realizing the difference between the Parisian method of treating the insane and that in vogue in his own country, he brought back to Turkey modern methods, which he strongly advocated. These had been fully installed before Miss Dix arrived at Constantinople and, in a sportsmanlike way, she admitted that there was nothing more that she could do there.

She lived many more years, in spite of her rather frail con-

A WOMAN BEDEVILS THE POLITICIANS

stitution. She visited other European and Near Eastern countries and returned to the United States, after doing a good deal to improve conditions in those far lands, or at least offering suggestions for improvement. Upon her return to this country, she was welcomed with open arms.

Shrewd woman that she was, she never permitted her influence to be used in a political way, in spite of the many efforts to that end after her return from Europe. So far as I can find out, she never even recommended the appointment of an employee. Her attitude was, that she was interested in the benefit of these people and merely hoped that when the matter was brought up, the right man would be appointed. Sometimes she was able to size up an individual and prevent a mistaken appointment from being made, but her recommendations were, on the whole, rather more general than specific.

In 1860 when war fear rose rampant throughout the nation, when state after state seceded, the inauguration of President Abraham Lincoln hovered like a black cloud over the heads of many who feared for the future of the nation. Plots were hatched to prevent his assumption of office.

In some mysterious manner, news of one of these plots came to the ears of Dorothea Dix. She learned that the President-to-be was to be killed in a deliberate train wreck on his way to take office. In fact, troops were drilling under the direction of those who intended to take over the government upon Lincoln's death.

In the same way in which Miss Dix prepared logical and accurate information to confound state legislatures, she marshaled her facts and presented them to Samuel Felton, president of the Philadelphia and Baltimore Railroad. After an hour's discussion with her, he was so impressed that he hired investigators to enlist among the potential revolutionists

MEN AGAINST MADNESS

who were drilling along the right-of-way extending through Pennsylvania to Washington. They soon learned details of the plans on foot, and as a result Mr. Lincoln was safely smuggled into Washington.

Since no one in the country had knowledge of hospital management to compare with that of Miss Dix, it is not unexpected to find her services in great demand during the Civil War. Indeed, immediately after she realized that war between the states was inevitable, she offered the services of a group of nurses and herself to the Union Government.

Secretary of War Cameron, and later Stanton, realized how valuable her services would be, and shortly after her application Cameron appointed her Superintendent of Nurses of the United States Government.

Miss Dix had seen military hospitals during her extensive travels and, because of her training, was able to organize the nursing services needed during the war. She purchased supplies and hired nurses, whom she originally required to be over thirty years of age and "plain-looking." They were forbidden to wear jewelry and hoop-skirts. She later had to modify her requirements as to age and beauty, but she did so reluctantly. Efficiency in this service, modified by sympathy, was the *motif* of her work, and it was only due to friction between her service and persons in the army medical services—who later had to do with writing the story of medical care during the Civil War—that her splendid work has not had the recognition it deserved.

Miss Dix lived to a ripe old age, finally dying in the arms, so to speak, of her "first-born child," for when her health failed she withdrew to Trenton State Hospital, which she had established, and there she passed away.

"QUACK" NUMBER ONE—GALL

AS one walks down Second Avenue in New York or North Clark Street in Chicago, one is very likely to pass a dilapidated store with grimy windows, behind which can be seen with difficulty a bizarre diagram of the human head. This is usually a colored profile, weirdly painted, and printed on a foully dirty square of canvas about three feet across. It looks superficially like a combination of a road map of some outlying section of the state in which counties are marked off, and a human head with a bad case of barber's itch. Many of the so-called gypsies, who once migrated through the United States casually picking a pocket here or snatching a child there, found these diagrams, based on the pseudo-science of head-reading, or character analysis by scalp-bumps, to be an excellent advertising medium and shake-down procedure.

Twenty years ago there were communities in the eastern part of the United States, in England, and in other parts of the civilized world where these ikons, which now rate with fortune-telling, were, to the gullible, not nonsense like palm reading or tea-leaf divining, but something really "scientific."

The "science" of studying character was developed to a fine point in phrenology, and it was not unusual, even at the turn of the twentieth century, for up-to-date and well-educated people to drag a child down to a phrenologist to have his character read and his future outlined. But nowadays the gypsies'

MEN AGAINST MADNESS

placards are only an advertisement of general fortune-telling. Most of those Romany fortune-tellers who exhibit them, do no phrenology and make no pretense of doing it. Phrenology is a lost art, but the phrenological diagram is as symbolic of fortune-telling as the cartoon Uncle Sam is of the United States. Nowadays the greasy fortune-teller who has probably seized you by a lapel to bring you in from the street, and who may well have gone through your pockets to decide how much money you have, will gaze mystically into your eyes or at the palms of your hands and pour forth a stream of hokum.

But that is not the fault of phrenology, nor is it the fault of phrenology's founder, Francis Joseph Gall. In spite of the fact that Austria is blamed for the existence of Gall, for he was a graduate of the University of Vienna, the Duchy of Baden, part of Germany, was really the place of his origin.

It was in 1758, on March 7, that a small Roman Catholic household was rejoicing in the arrival of Francis Joseph. Francis was originally intended for the Church, and it was somewhat to the dismay of his parents that nature study and wandering in the fields of the neighborhood appealed more to him than did classical study. He showed some interest in studying animal life in the fields and woods, and he chose medicine to be his vocation. To begin his scientific work, he entered the University of Strassburg. He was not at first a particularly bright or interesting student and, since Vienna was the lodestone for those who wanted to develop a medical career, he betook himself to that city as soon as possible and entered the medical school. Upon graduation, he settled down in Vienna and strangely enough, in the light of his later dramatic personality, attracted but little attention.

But soon after graduation Gall began to carry on investigations into the structure and function of the nervous system, making himself obnoxious to his less aggressive colleagues by

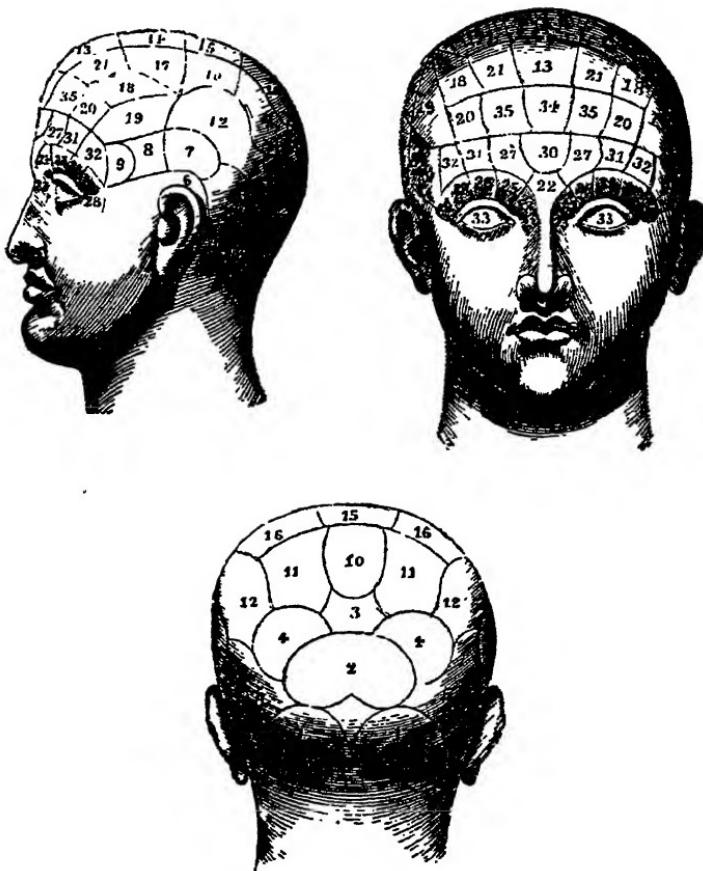


Plate XXIII

ONE OF GALL'S PHRENOLOGICAL PLATES

The numbered areas represent Gall's idea of the localization of the various traits.

MEN AGAINST MADNESS

the energy and persistency of his tremendous interest in the brain. While only a school boy it came to his attention that boys with round heads or with eyes placed far apart had different mental capacities than their confrères. He decided that the shape of the head must have something to do with the thinking process. It is not uncommon today for a well-educated novelist to describe his nautical hero as having gray eyes, well set apart, "with that look in them that comes only to those who have gazed into the horizon for days on end," or some such nonsense; or "the heroine had eyes well set apart, indicating a fine judgment of the beautiful."

It appeared to Gall that he probably could gain no idea of the significance of head shapes and of the mental traits that accompany them unless he were to study thoroughly such individuals as might come to his attention. He decided that the general run of his friends, student acquaintances, and patients probably could not be studied as well as could criminals and asylum inmates. So not only did he examine the insane in the asylums, but he began to dissect the brains of those who died there. He also dissected the brains of animals, a fact which perhaps makes him one of the earliest experimental animal psychologists, although his contributions in this field were made early in his career and consequently have little bearing upon the development of psychology as we see it today. But other observations made by Gall have been of great importance to us who are engaged in the complicated field of mental medicine. Gall localized various traits in the brain and adopted the theory that under- or over-development of them would show on the surface of the skull.

In 1796 he made his first announcement of his discoveries, in a letter to a friend, one Baron Retzer, who was the Imperial Censor of Vienna, but it was not until two years later that this letter was published. One wonders what occurred during

"QUACK" NUMBER ONE—GALL

those two years. In all likelihood Gall was building himself a reputation. He was making friends and was exerting enough influence upon the Baron so that his communication, which probably seemed insignificant at the time that it was received, could be published. Gall was a close friend of Dr. Von Storck, who was physician to the Emperor of Austria. Because of this friendship the proper influences were lined up so that Gall was to have been appointed his successor as Body Physician to the Emperor; but Gall's biographers all say that he declined, and recommended another man, Von Stiff, who later on turned against him and condemned his doctrine. He took this attitude because Gall was a man of a rather positive temperament, was aggressive, and whether he actually turned down the appointment—which after all carried with it the recognition of Gall's medical ability and political acumen—or whether he merely competed with Von Stiff to get it, in either case the man who actually got the job would naturally have found the other a challenge. Von Stiff, like so many other medical men of dubious or of only average accomplishment, did not hesitate to ingratiate himself with great men, like the Emperor, and eventually became so important that he was titled "His Medical Majesty."

Contemporaneously Gall started to lecture on his theories of the nervous system. Fluent, attractive, and having an interesting subject, he did not hesitate to set himself up as the one-authority on character reading, pointing out that there were certain characteristics of the mind which he could diagnose and make clear to the possessor so that they could be used to further the subject's ambitions. Under the guise of being scientific and protecting the laity of Vienna from crack-brained medical lecturing, Von Stiff appealed to the clergy of Vienna, and had no difficulty in getting them to ban Gall's lectures. The argument presented against him was that his

MEN AGAINST MADNESS

doctrines were too materialistic, in maintaining that no longer was man's soul something presented to him by God, but, according to Gall's teachings, merely a function of his brain. This doctrine, in itself, true or untrue, should justify the carving of Gall's contributions to psychology, neurology and psychiatry in stone, but unfortunately Gall today is considered a charlatan and a quack by psychologists who have read only criticisms of his work.

It must be admitted that he devised a system of character reading which after only a few years was proved to hold no water, but the man did make vast and careful investigations, and it was probably due only to the intellectual weaknesses of his time that his contributions were not admittedly greater, and did not carry more weight. If he had had at his disposal some of the techniques which we have today for dealing with experimental material, and for doing microscopic work, his procedure of examining hundreds of cases under very exact conditions, careful understanding of what Gall tried to do would place him among the most important neuropsychiatric contributors that we know.

The Austrian government, however, in the devious way in which governments sometimes act, blasted Gall with general regulations prohibiting all private lectures unless special permission was obtained from the public authorities. Rumors of the development of a clerical cabal against him came early to Gall's ears, so that when this decree was promulgated there was no doubt in his mind that he would have to comply with it, and he attempted to do so. He drew up a long explanation of his theories of brain-function and of the material that he had disclosed in his anatomical studies, pointing out, among other facts, that he had spent tens of thousands of florins of his own to underwrite his investigations.

But Gall found to his dismay, as had many others before

"QUACK" NUMBER ONE—GALL

him, and, unfortunately, as have one or two since, that when the Church makes up her mind, there is little use arguing with her, so that, after struggling on for a year or so he professionally gave up the ghost in Vienna and removed to Berlin.

His attractive lecturing manner and the novelty of his speeches, as well as his plausibility, had made it easy for him to secure a number of invitations to lecture in various universities. He was in a position to secure an excellent appointment when he settled in Germany. But no matter how liberal the thought in a country may be, there is a tendency to reject the alien. In spite of the fact that Gall really was German-born, his quick rise in the medical field turned against him a number of his jealous colleagues, who, as quickly as they could, repeated the treatment which had previously been accorded him in Vienna.

A medical and surgical journal published in Edinburgh, in March, 1806, describes the visit of Gall to Berlin: "The craniology of Dr. Gall was the favorite topic of the German literati during the summer of 1805, at almost every university and capital of the Northern Provinces of Germany. In the beginning of last spring the Doctor set out for Berlin and lodged in the house of his intimate friend, Mr. Kotzebue. He there met with universal acceptance. The King, the Queen, princes and princesses, interested themselves so much in his discoveries that he obtained an invitation to go through a course of lectures in the presence of the Royal Family, during which the Queen inspected the dissection of a human brain, while the Doctor demonstrated the whole series of his astonishing discoveries. . . . A rancorous attack was now commenced against his theory by Dr. Walter, leading anatomist in Berlin, but it failed of the intended effect, every person being convinced that it was dictated by envy. On the opposite side, the justly renowned Dr. von Hufeland, first Physician to the

MEN AGAINST MADNESS

King, almost all the faculty, as well as others, professed their full assent, and several interesting charts were published, in which ample justice was done to the theory. . . . Dr. Gall visited the houses of correction and prisons in Berlin and Spandau, and gave the most convincing proof of his ability to discover, at first sight, such malefactors, thieves, and men of particular talents as were amongst the convicts and prisoners. At Torgau, where he also visited a house of correction, Professor Bottiger accompanied him, who afterwards published Gall's observations. . . ."

When Gall visited the prisons of Berlin and Spandau, he made a tremendous impression on government and other officials. In the presence of the warden of the prison and the head of the criminal investigation department, as well as a number of Prussian government officials, he interviewed over two hundred prisoners and, without any other information, was able, by studying their faces, the shapes of their heads, and in other ways using his techniques, to state, not only the nature of their crimes, whether murder, theft or fraud, but also to point out some of the natural characteristics for which they were known to the authorities. Professor Walter, the man who was in opposition to Gall, admitted that this was an excellent test, and he also admitted that Gall was able to point out the most characteristic thieves from their companions who had but minor records. He selected two cases, for instance—one, a man by the name of Columbus, and the other a little youth—in both of which cases Gall advised that they should be kept in prison for life. It was interesting to note, Walter admitted, that during their trials it came out that both of these men had thieving propensities far beyond those found in most prisoners. Walter's argument was not on the basis of the test—he admitted that that was good—but he was afraid that Gall was drawing science away from its legitimate sphere. He refused to admit

"QUACK" NUMBER ONE—GALL

the fatalistic implications in Gall's work; namely, that sometimes a man was born with, or in early years developed, a tendency toward criminality which was so deeply ingrained that it could be discovered by examining the shape of the head. In other words, to admit that the trait was actually there in a man's structure offered no hope for his redemption. If a man were born to be a thief, he could be nothing else but a thief, and naturally this was and is contrary to the tenets of both medicine and religion.

Psychiatrists have always hoped to regenerate and cure their patients. If, in the case of antisocial tendencies, this cannot be done, we immediately lose hope. There is much to Walter's argument. As a matter of fact, one hears it even today. When the prison warden or a parole officer comes before a legislature and asks for some money for carrying out treatment within the prison or outside of its walls, he is usually refused, not because the legislators believe, with Gall, that a man is born to be a criminal because of the structure of his brain, but because many still believe that a man's character is immutable from the day he is born until he dies. Modern clinical studies show that this is contrary to fact. Social and other environmental pressures produce the majority of our most serious delinquents, although one must admit there may be certain susceptibilities in their make-up at birth. For this reason the perniciousness of Gall's doctrines must be admitted.

If he could make the diagnoses which apparently he did, one can not deny the remarkable perspicacity of the man, although recent psychological studies have showed that the examination of the face, the expression, and the appearance of a man is just as likely to be wrong, as an indication of his personality, as it is to be right.

But Gall recognized facts in his day which even today the population at large is unwilling to admit. Scientists and trained

MEN AGAINST MADNESS

penologists do so, but the general public and those relatively untrained people who often have to do with criminals do not recognize facts which Gall boldly stated. In an answer to Professor Walter he pointed out that, after all, a man was in prison or incarcerated for a crime, that he may have no great propensities to commit that crime, but circumstances outside of his own make-up may have made it necessary. This was a startling admission, for throughout the ages we have been more willing to admit that a man was a born criminal than to admit that his environment might have made him so.

Gall admitted that when a man was recidivistic, that when his criminal tendencies were repetitious, this condition was more likely to be an inbred thing, although this is something that even today we are not quite willing to consider proved. A man may have committed a crime today, and may seem to the newspapers or to the layman to be a hardened offender because he has done the same thing over and over again, but this attitude is taken because we have lost sight of the fact that when he gets out of prison he probably will have no friends except those he has made in the prison, and others like them, and naturally he has to depend upon them for support. They are likely to lead him to commit a crime similar to the one for which he was incarcerated; and weakness may have been the principal characteristic in his make-up, so that he is easily led astray. Such a proposition was one hundred years too far advanced for Gall to consider, but he *was* willing to admit that some people might be in prison, not because they had a propensity for theft, but because jealousy, revenge, or other characteristics of that sort might well have been acting upon them as law-abiding citizens and finally led them into committing a crime for which they had had no great predisposition.

With these ideas in mind, we must admit that Gall was the founder of our modern criminology. He pointed out that

"QUACK" NUMBER ONE—GALL

legislators and moralists thought that they had a consciousness of what was right and what was wrong; they thought that the same clearness of vision of right and wrong existed in all other men, and that therefore, if an individual decided to commit a crime, it was because he had "made up his mind" to do so. For the first time in the history of penology a statement was made by him, upon one occasion, that "a sentence in crimes has been considered without regard to the mental organization of the man who committed them." Gall said that he satisfied himself that the greatest number of criminals were born in bad districts, and that the greatest difficulties in which they found themselves were due to lack of education and proper moral upbringing. He said "criminal laws have been made which have only determined what acts are to be considered culpable, and fixed for each a proportion of punishment without considering the different circumstances of the individuals offending."

It has been argued that if a man's evil propensities are innate, there is no longer any culpability in vice and crime; no one in these circumstances can avoid doing evil, and the criminal need only say that he has such and such a propensity, to excuse all his actions and secure himself from any just liability to punishment.

Gall urged that crimes and misdemeanors be considered not as abstract existences but as the results of acts of individuals, and must be estimated according to the nature of the respective individuals. A logical outgrowth of this type of reasoning was that prisons must become houses of correction, so that if a man had any tendency to do wrong, if he had a propensity toward wrong-doing overdeveloped in his mind, society must do everything in its power to correct this propensity. He urged remedial work in the prisons, and urged for the first time that prisoners should be instructed in reading, writing, and the

MEN AGAINST MADNESS

ordinary school subjects. It was Gall's idea that all men are potential law-breakers, for he felt that few men are so constituted that they might not make some sort of slip. He pointed out two causes of crime which are, even today, sometimes forgotten. One of them is lack of education.

How many of us know what actually constitutes a crime, and how to avoid it? In my own experience in dealing with criminals, I am daily made aware of the fact that many of them commit their crimes without knowing that society frowns on such behavior.

The other cause for crime, too little recognized, he said, is necessity. If a man has no way of doing as well as his brothers at making a living and providing himself with food and shelter, he is apt to commit a crime.

The von Hufeland and Walter argument went on for a long time. In the midst of the heat of discussion Walter claimed that Dr. Gall was completely ignorant of anatomy, that he promised much and performed very little, and that he saw no such parts of the brain as he pretended to have shown. It is quite obvious that Walter himself was as ignorant as most of his contemporaries about the structure of the brain, so ignorant that he could not recognize, in the early works of Gall, the very accurate descriptions of brain structure. Von Hufeland might have cleared the whole matter up if his opinion had been followed by succeeding generations, and if Gall had not been condemned as a charlatan because of his being dramatized by his disciples, and because of the weakness of his system.

Gall founded much of modern cerebral physiology, although he contributed but little in individual factual material. He presented this material to von Hufeland, Physician to the King of Prussia. Von Hufeland, enlightened physician that he was, admitted that there was much to what Gall showed and that his dissections were beautiful. And he notes the one thing

"QUACK" NUMBER ONE—GALL

that many of our contemporary authors, in dealing with the history of physiology of the brain, fail to note: namely, that Gall described two types of nerves, those going *from* the brain, and those coming from the periphery *to* the brain.

What this means is very simple: If one touches the eye with a feather a sensation is set up which passes from the eye to the brain—this is called a *sensory* impulse. In the brain it passes through a number of way-stations, and the impulse again goes out toward the eye or to the back of the neck, the nerves carrying these impulses being known as *motor* nerves. As a result of this impulse going out to the muscles of the eye, or to the muscles of the back of the neck, the person either blinks his eye or pulls his head back. Until Sir Charles Bell and his contemporary in France, Majendie, stressed all this in a more detailed fashion, the concept was not even believed to exist; yet we know that Gall did demonstrate for the first time the difference between these two kinds of nerves. It was von Hufeland's opinion that Gall was exempt from prejudice, that he was not a charlatan, and that all his science was based upon observation. Gall at that time did not sanction the phrenological system which is now condemned; he did make observations which helped in an understanding of the physiology of the brain and the motivation of human activities.

Probably the one reason why Gall is held in so much disrespect by brain physiologists today, and was so contemptuously treated by his own colleagues, is the fact that he and his colleagues, Spurzheim in particular, attempted to make an all-inclusive system out of the few isolated and very unsatisfactory data which he was able to demonstrate objectively.

From Berlin, Gall went to several other German towns. He lectured and gave demonstrations of brain dissections and his work raised him in popular and scientific esteem. In 1807 Gall arrived in Paris.

MEN AGAINST MADNESS

He repeated his demonstrations before numerous learned societies, and presented a memoir to the Institute of France. Because of the fact that Cuvier, the famous anatomist, Flourens, the physiologist, and others were already convinced that Gall was on the right track, there was extreme likelihood that he would receive the same acclaim in France that he had been given in Germany. He was being very successful in Austria, where he was a challenge to the pocket-books of his colleagues, while in Germany and France he was merely a visitor.

Unfortunately Gall came upon some interesting social phenomena; not only prejudice against foreigners, which in these annals we see demonstrated frequently, but the attitude of the man who, being an expert in one line, thinks he is an expert in all others.

In France, when Gall arrived, Napoleon was unquestionably the cock of the roost. He was in the midst of his most successful campaign; he had reorganized the laws of France; and he had set up a stable social organization. He also was leading a considerable love life. In these fields Napoleon was unquestionably pre-eminent. He was a great soldier, unquestionably a fine social administrator, and, so far as we can find out (history expresses the facts in a rather cagey way), he was a Lothario of no mean character.

But as a scientist he had no right to express himself. The "Yes men" who surrounded him, as they do all celebrities, probably made him think that, because his brain was superior in some fields, this gave him the right to express an authoritative opinion in others. So he even told the Institute of France "where it got off" in the matter of approving theories and taking in members. Also, he reprimanded the Institute severely for submitting to instruction in chemistry by an Englishman, Sir Humphrey Davy, one of the most outstanding chemists of all time. Since Napoleon frowned on outsiders, it is quite

"QUACK" NUMBER ONE—GALL

natural that Gall's memoir should immediately be rejected. The Institute of France had disapproved of nearly everything else that was worthwhile in the past, and had frowned on some of Mesmer's best contributions, so that probably the finest recommendation that Gall's theory could have, to us looking at it from the present, would be the fact that his doctrines were condemned by that organization or its predecessors.

Napoleon, during one of his raids on Prussia, had come in contact with a metaphysician, and asked him about the works of Gall, which were widely being spoken of at that time. It is unfortunate that Napoleon secured what advice he desired from the wrong man, for the metaphysician said simply that the workings of the mind are merely too complicated for any man to comprehend and for that reason one should give no credence to the works of Gall.

Think how drastically stupid that was! Here was a man who had spent his whole life in studying anatomy, who had been observing, had made certain interpretations. But because the person in supreme authority secured the wrong advice, or a poor opinion, research is set back for a very long time. It is only fortunate that, at the same time when Gall received his setback from the Institute of Science, other people were being stimulated to make some more studies.

Much research was being done in all of Europe in the physiology of the brain, and while Gall's theory of localization was a great step forward, one must honestly admit that its phrenological concepts built up by his disciple, Spurzheim, during the same time that Gall was trying to be a bit conservative, put the whole thing on the basis of charlatanism, mind-reading and quackery. Napoleon's first physician, Corvisart, a very fine doctor and an intellectual person, was in sympathy with Gall, but could hardly say much, since Napoleon had made up his mind the opposite way—and he was the sort of person that

MEN AGAINST MADNESS

no argument could change. One of the reasons why he discharged Corvisart, probably the leading authority on heart disease of his time, was to have himself cared for by Francisco Antommarchi, an opponent of brain localization. Antommarchi did his best to ruin Gall, and yet as a man he could come within no measurable distance of Corvisart, who had appreciated Gall. As a matter of fact, the only book that Antommarchi wrote was based on stolen drawings by an Italian by the name of Mascagni.

The chief resistance, however, to Gall's work was an ignorant layman's reaction. Napoleon was against a deep-seated explanation of the working of nature—he believed that we could judge men only by their actions, that there were no more subtle ways of studying character. All that Napoleon could see in Gall's doctrine was a system of character reading by the protuberances of the head. All Gall's other opponents have taken this same attitude, ignoring the real scientific angles of his research.

In a splendid book entitled "In Search of the Soul" Bernard Hollander makes an attempt to reconstruct the picture of Gall's work and to show how all his brain studies contributed to our development of knowledge of basic characterological deviations. The material covered in these two large volumes is too much to be described here, but it certainly will do no harm to summarize in a few words just what Gall's contribution to the battle by men against madness has been.

Gall entered the picture at the time when ignorance of all scientific things about the brain and the working of the mind was paramount. There were still a lot of theories about fluids running down the tubular nerves; men's souls and their characters, it was said, descended from God and were incapable of being described. Gall, then, broke down the behavior of man into various types of special interests, or, as we now call

"QUACK" NUMBER ONE—GALL

them, faculties. He pointed out that in all of us there is more or less love of ourselves, more or less love of others. The ability to judge distances, too, for example, is different in one man's mind from what it is in another. From all of these comparisons has come a branch of psychology which now we are stressing greatly—the psychology of individual differences. One of the basic concepts which lie behind the psychiatric examination or the intelligence tests of today, is the knowledge that one man is different from every other. We must be able to describe characters in such a way that we can show how each person differs from his fellows.

Gall instigated this concept. Had he merely enumerated a number of traits, he would have made a great contribution to neuropsychiatric knowledge, but in addition he did point out that the brain has special functions. Unfortunately he resisted and resisted experimental study of the brain physiology when he was contradicted by Marie J. P. Flourens, who maintained that there are no parts dedicated to special function, but that the brain acts as a whole. In this connection Gall said that a study of the animal brain, through cutting out parts to see what damage is done to function, was not the right way to approach the subject. We do know now after a hundred and twenty-five years that this is certainly one way. Some scientists are only hoping that the opportunity will come to students of psychiatry, of psychology, and of the physiology of the brain, to operate on the human organism from an experimental standpoint.

During the last century in France some research was done on the brains of some living criminals, and perhaps some day society will see that it is to its own interest to permit this to be continued, so that the criminal may pay for whatever harm he has done by advancing our knowledge of the function of the human mind. This would be definitely contrary to the

MEN AGAINST MADNESS

teaching of Gall, but we should never have reached the stage where we could even consider such experiments, if it had not been for him. Gall was the forerunner of a new era, an era which was characterized by research on the living organism rather than by speculation. Even up to 1800 most of the work that had been done in trying to understand the mind had been done by philosophers who were only speculating about the subject and had little comprehension about either the mechanics of the human body, including the nervous system, or of social interrelationships. Theology was insufferably woven into the picture, and the dicta laid down by churchmen had been having rather a ghastly influence on the progress of science.

Nevertheless, Gall's tenets, arousing such a furore as they did, required refutation. If his statements about inbred mental qualities were to stand, little could be done to improve the human race. Because of Napoleon's pressure on the French Academy, Gall was squelched as a scientist but the questions which he raised were not yet satisfactorily answered.

The earliest experiment performed to see how the mind works mechanically, was carried out by Flourens. Flourens was one of the leading physiologists of his day. He had acquired an operative technique which permitted him to remove organs from animals without killing them. One must remember, however, that from 1810 to 1830 animal experimentation could be nothing but crude. There was no such thing as anesthesia, with the result that the animal struggled and was most difficult to operate upon. Flourens removed bits of brain from pigeons, the amount taken away varying in size until the pigeon was almost brainless. Unfortunately he was not a very good observer for, as nearly as he could make out, there was no change in the conduct of the pigeon at all with much of its brain gone. It could fly; it was more or less able to go

"QUACK" NUMBER ONE—GALL

about its business; and Flourens concluded from such behavior as this that the brain had practically no intellectual function or, if it did have any, the function was so complex that one could not analyze it with any degree of certainty.

This demonstration was a blow to Gall, although he bitterly resented the experimental approach and argued that it was unsound. He thought that removing an organ was no way to show how it functioned. Yet today it has been proved to be one of the best ways of demonstrating the function of any part of the living body, for by means of it we can tell, by what is lacking in the subject's behavior after an organ's removal, just what service the missing part supplied.

Gall had the idea that the brain was broken up into little segments. Flourens advocated the point of view that the brain acted as a unit, thus reverting perhaps to the still older point of view that the brain was merely the seat of some sort of vital existence. Flourens' difficulty was that he was not critical of his own observation, as, indeed, he scarcely could be because in his day there was no organized physiology, and no psychology, but mere speculation. No one had any idea of such a science as comparative behavior. In other words, the experimenter didn't know the *normal* behavior of the animal he was studying. The reader must not forget that Charles Darwin had not yet expressed his ideas on evolution, so that if any animal experiments were carried on, any results that the experimenter might obtain could be interpreted only by the theological reasoning that only man has a soul, hence since the organ of soul or mind was absent in animals, they presented no relationship to the human mind.

Later experimenters checked Flourens' findings and discovered that animals do behave differently upon removal of the brain.

If the operator has carefully anesthetized the pigeon he can

MEN AGAINST MADNESS

easily remove the small flake of bone over the brain which constitutes the skull of the bird. With great care he then removes the two lobes of the brain, but he leaves a large lump of brain tissue down near the place where the spinal cord begins. The pigeon is carefully treated; the scalp is sutured closed; and to all intents and purposes the bird is as good as new.

If the next morning, we go to its cage, take the bird out and set it on a table, then—if we are not critical or if we know as little as Flourens did—we can see no change in its conduct. When placed on its back, the bird succeeds in regaining its feet. If we give it a push, it continues to walk, and if it should happen to meander to the extreme edge of the table after we have started it, and begins to fall off, it flaps its wings until it has regained its balance. If we throw it up into the air, it flies about in seemingly a perfectly normal manner; but—and here is an important point—unless we throw it into the air to make it fly, or unless we give it a little push to start it walking, it stands around in a sort of drowsy pose; its eyelids droop, and although the pigeon doesn't stick its head under its wing as it would at night to sleep, it seems to the casual observer to be asleep. We may sit there and watch it for a while and it may spontaneously look up, yawn, shake, and then preen itself.

A fly is droning about the room and settles on the pigeon's head. It shakes its head to get rid of it. If we pass a hand quickly in front of its face, it will pull its head away with a perfectly natural movement. In other words, offhand it seems to be a pretty healthy bird.

I recall performing this experiment before a group of co-eds at the University of California when I was teaching physiology. Those girls felt that there was nothing the matter with the pigeon, and to them the demonstration was singularly unconvincing. It never occurred to them that a normal pigeon would

"QUACK" NUMBER ONE—GALL

have flown away when I made a gesture at it; that it made no attempt to escape when I was pushing it; and that, while it showed many signs of annoyance when it was left alone, it resumed its usual drowsy posture instead of interesting itself in goings-on about it. The girls attributed the pigeon's difficulty to the bloodshed and operation, and one of them, thinking of an appendectomy which she had had some time before, remarked that she was just that drowsy the day after she was operated upon. Probably Flourens, although a scientist, since he lived a century ago made about the same type of observation.

But it was pointed out to these girls that there was one thing which one could notice in the pigeon. Even after a sufficient time had elapsed so that all the effects of the operation would have worn off, it initiated no spontaneous movements. Its lack of fear was particularly startling, and finally, as the conclusive proof of the fact that there was damage done when the brain was removed, we put an unoperated pigeon in the room with the damaged bird. When we would only gesture at the unoperated pigeon, it would try to fly away, try to escape, while our poor patient would only waddle over to the edge of the table or aimlessly fly about the room if startled.

It is interesting to note how various animals are affected by operations on the brain.

Experiments have been made upon the frog. If we remove the cerebral hemispheres from this animal, what do we then find? We find that a frog will maintain its normal attitude, so that if we try to turn it over on its back, it immediately flops back on its face. If we lay it on a board, which we might tilt one way or another, the frog will desperately attempt to keep its balance. If it is thrown into water, it immediately starts to swim with an accurate and energetic breast stroke until it comes to the edge of the vessel. In a seemingly deliberate

MEN AGAINST MADNESS

way it will climb up the side and squat down, awaiting the next experiment. The brainless frog perhaps is more appreciative than the normal one, for if we stroke its side it croaks. In fact, Sir David Ferrier said, "If its back can be stroked gently, it will utter loud croaks, and this with such uniformity on each application of the stimulus, that, as Goltz indicated, a chorus of brainless frogs might be obtained which would utter their croaking sounds on the appropriate occasion in a manner which would have delighted the heart of Aristophanes."

In contradistinction to the pigeon, which makes no effort to protect itself when someone threatens it, the frog shows some sensible reaction. If we put it in a dish of water and gently raise the temperature, it will not just lie there and allow itself to be cooked, but will urgently try to escape. In comparison, the silly old pigeon if placed on a hot plate will lift one foot after the other, performing a little dance, increasing in rapidity as the plate becomes hotter. If the experimenter is not tenderhearted and does not remove the poor pigeon without a brain, before its feet are cooked, it will be badly burned. It makes no attempt to fly away, even though it is quite capable of flying.

Later observers on the conduct of the decerebrate pigeon realized that the animals can walk around obstacles in the daylight, but are really blind. In other words, they are blind in the sense that they can not interpret what they see, but just act as though they were automatons. It is this type of phenomenon which is so interesting to neurologists, namely, that although the eyes may be perfect and the nerves going from the eyes to the brain be undamaged in a case of brain tumor or accident, if a certain part of the cerebrum has been injured or is diseased, there is blindness. The layman unfortunately thinks that there can be only one kind of blindness and that that is due to



Plate XXIV

A PIGEON WITH THE CEREBRUM REMOVED



Plate XXXVI

TYPES OF MENTAL PATIENTS AS SEEN IN A

MODERN OCCUPATIONAL THERAPY WARD

Courtesy of Dr. P. C. Robertson, Superintendent, Ionia State Hospital.

"QUACK" NUMBER ONE—GALL

injury or disease of the eyes or the nerves coming from the eyes.

With the expression of the theory of evolution by Darwin in the late 1830's, everybody's attitude toward animal experimentation changed. No longer were physiologists experimenting on animals merely to see how they reacted as animals but for the reason, also, that, since there was admittedly a succession of steps in the development of man, if one knew something about behavior of animals, representing the stages that man passed through in his development, one might get an idea of the function of the human body.

Almost everyone has heard a great deal about the so-called biogenetic law or the Law of Evolution. This law merely says that the human embryo in its development passes through a number of evolutionary stages representing the stages taken by the human race in its upward climb. At its beginning, in the very first stages, the human body closely resembles the eggs of some sea animal. In fact, it very closely resembles tiny single-celled animals which live alone. As it grows in size, it passes through a stage where it has many features similar to the fish. It even has gills, which later on disappear to form the ears and lower part of the face. Some rather unkind critic of the human race has stated that the human embryo goes through the rabbit stage and probably in many cases, particularly in the case of some comedians, never passes out of it. But suffice it to say, the human embryo does climb an evolutionary tree which is very much akin to the history of the race through many millions of years. If, then, we presume that the nervous system develops in a way analogous to the steps in the evolutionary tree from the minute sea animal through the earthworm, fish, and lower mammals, each with an increased nervous development, we might be able to profit

MEN AGAINST MADNESS

from a study of the behavior of those animals and better understand the formation of the human mind.

There is no need here to discuss all the theory of evolution and the furore that it caused throughout the civilized world. The die-hards, including the theologians, naturally held the fort to the last. But the whole theory and the way that it was worked out was so reasonable that the scientific men quickly assumed its truth and began collecting information to verify it. As for its relation to the study of the nervous system, the theory of evolution was the most helpful formula of science to stimulate experiments and study that ever was made. With the increase in the use of careful and clean surgery, physiologists could see what happened to man when he had an organ or part of an organ removed. If, for instance, we removed a man's gallbladder in a careful operation, so that he continued to live, we found that very often he had trouble digesting fats. In the case of the famous Alexis St. Martin, Beaumont's patient, in Sault Ste. Marie, Michigan, a gunshot wound in the abdomen made it possible to find out what was going on in the stomach. Beaumont could look right in and see.

Unfortunately it has been almost impossible to do the same thing with the brain. Occasionally, a man's head has been injured and his resulting conduct has been carefully watched, and recently, of course, brain surgeons have been removing tumors and bits of nervous tissue to see what will happen when the body is deprived of its services. It has required thousands and thousands of operations, each one needing careful studies before the sickness came on and after it developed, to reveal the changes made in the mind by the disease of the brain which is studied by operation or autopsy. Even today the function of the mind is almost entirely unexplored in microscopic detail.

But it was possible, then, by means of animal experimen-

"QUACK" NUMBER ONE—GALL

tion at least to begin to acquire some knowledge of how the brain worked. What were the possibilities of study?

The first one, of course, was to remove a little bit of the brain to see what happened. The second one was to open the skull of the conscious animal, and then to irritate some part of the brain to see if a movement resulted, or in case of man to see what he felt. If one were to assume that such experiment were possible, it is necessary to do away entirely with Flourens' idea. As long as the brain supposedly acted as a unit, it was not to be expected that its various parts would be connected with specific parts of the body.

But Gall had an idea that this latter possibility was the case. He had noticed that the brain is made up of fibers with a coating of gray matter. In other words, it looks like bundles of string with a sort of gelatinous coating outside of it. What this meant, he didn't know, but his successors were soon to find out. The microscope was becoming popular. About the same time that Darwin discussed the problem of the origin of species and the ascent of man, a couple of obscure German biologists, Schleiden and Schwann, expressed the cell doctrine, namely, that the body is not made up of gigantic masses, but that, if one looks at an organ under the microscope, he can see that it has a number of tiny entities, each with a definite construction, bunches of which make up the thick masses. These cells, these tiny entities, were of one kind in muscle, of another kind in bone, and it was found by careful microscopic examination that this was also true in the case of the nervous system; that the brain and the spinal cord were made up of cells. A typical nerve cell looks somewhat like a tennis racket with a string tied to the end of the handle. The broad part, where the ball is hit, is the cell body, and this is where the cell manifests life.

MEN AGAINST MADNESS

The masses of cells of which the brain is composed are likened to a sort of switchboard. We have already made note of the fact that Descartes and others had the idea that, if the sole of a man's foot were tickled with a feather, the skin or something else contracted and pulled a string which was the nerve, and which set off a valve in the brain, squirting fluid to pull another string, this being still another kind of nerve returning to a muscle that operated in the foot so that it would be pulled away. The nervous system really works in a very similar manner, except that the nerves don't move. When the skin or the sole of a foot is heated, an impulse passes up a nerve. Just what this impulse is we don't know, but we can see that the nerve does not move. We do know that, if we put an electrical indicator along the nerve, we can see the needle jump, which implies that there is either electricity present or something like electricity. This impulse goes to the spinal cord, where it connects with another nerve, reaches the brain, where it passes across a great many switches or connections, and finally is returned down another kind of nerve to contract a muscle. This we pointed out in discussing Descartes.

The first kind of nerve, the kind that carries the impulse to the brain, we usually designate as a *sensory* nerve. The kind that moves the foot we naturally call a *motor* nerve. It *moves* the foot, just as the motor of an automobile moves a car. The motion itself, of course, is actually carried out by muscle.

The whole thing seems like a very simple procedure, and I imagine that most of my readers have been somewhat accustomed to hearing it discussed in even more scientific terms than I have used. Yet, until the first part of the nineteenth century this notion had not been formulated. Previous to the time of Sir Charles Bell in England, and François Magendie in France, no one had really discovered that there was such a phenomenon as a reflex, and that certain nerves carry impulses from the eyes,

"QUACK" NUMBER ONE—GALL

the ears, and the various other sense organs to the brain, either directly or by mediation of the spinal cord, and that other nerves carry these impulses out to the muscles and glands, enabling people to go into activity as a result of what has been seen or heard, smelled or felt.

Alexander Walker, an obscure Scot, really first expressed this difference between sensory and motor nerves, but it took Sir Charles Bell, famed anatomist from Edinburgh, to attract attention to it. For just as in the case of the inventor who with no business acumen, buries his light under a bushel, just so, earlier discoverers such as Walker made no impression on scientists. Walker's contemporaries had already implied that the brain and the spinal cord were made up of bundles of fibers, that the spinal cord in particular had columns of fibers extending from the brain down the cord, connecting with nerves going out to the muscles, and that there are other nerves that connected with the spinal cord and sent connections up to the brain.

But Sir Charles Bell viciously attacked Gall because, he claimed, Gall did not recognize this fact. We have seen that Gall had rather a good knowledge for his time about at least the anatomy of the nervous system, if not its physiology. But Bell ignored this. Bell's contempt was based upon the character-reading teachings of Spurzheim, and he believed that there was little localization of functions in the brain—or that, if there were, it could not be proved—a contention based on considerable research on the part of more recent students of the subject which has been shown to have no basis in fact.

Bell was a sort of contemptuous fellow, anyhow. He went to London, where he was jealous of the success of a brother. Here he built up a rather good practice, but finally withdrew again to Edinburgh to pursue some of his other activities. He took a great deal of interest in the subject of physiognomy,

MEN AGAINST MADNESS

pointing out that there were certain nerves that did move groups of muscles for a particular emotion. This was in line with Gall's work, in spite of the contempt which Bell had for his predecessor. The interesting thing about Bell is that he laid claim to the fact, as his great discovery, that different nerves carried sensation and different nerves carried motor impulses.

In 1821 he was said to have operated on a rabbit, exposing the soft spinal cord inside of the bony vertebral column. When he irritated the nerves coming out of the back of the spinal cord, he could see no motions; when he irritated those at the front, he noted that here, at each touch of the forceps, there was a corresponding motion of the muscle, and that each of these little nerves had a group of muscles to which it was attached. We can see from this that he did not necessarily realize that there was a purpose for the nerves at the back. All that he knew was that they didn't carry motion to the muscles.

It remained for Magendie, over in France, to show that there really was sensation carried from the skin to the cord by the nerves at the back.

Bell was a hater of vivisection, and many medical historians have explained the controversy between him and Magendie (which has been continued almost to the present time by their followers) as to who really made this discovery, by the fact that Bell was unwilling to publish the results of his experiments on animals. Neuberger, a very famous medical historian, claims that Magendie must have known of Bell's discovery, because one of Bell's pupils gave a lecture in France before Magendie published his findings. Fulton, now a professor at Yale, is of the belief that Bell changed his manuscripts after Magendie's report came out, to imply that he had really discovered both sensory and motor nerves. We are inclined to believe that Fulton is correct, because we know that Bell was

"QUACK" NUMBER ONE—GALL

a contentious, sensitive, and irritable sort of chap, and while his drawings were remarkable, his ability to diagram anatomical features of the human body having possibly never since been equaled, we have no guarantee that his scientific morals were above reproach.

But this work was the beginning of a new era in an understanding of the function of the mind and of the nervous system. Experiment followed experiment. Animals were studied, from the lowest to the highest, and, with the increased use of the microscope, it was possible not only to find out how the nervous system was constructed in its gross form, but also to see to some extent where the connections were between these tiny nerve fibers and cell bodies.

With a knowledge of the work of Bell and Magendie, Marshall Hall, who was a distinguished English physician and experimental neurologist, made some very excellent discoveries. He devoted the major portion of his professional life to the study of the nervous system, being particularly interested in involuntary motion. A very well read and brilliant man, he received his Doctorate in Medicine in 1812. As a matter of fact, he was so well read and so brilliant that when he turned out to be a little bit cantankerous later in his life, he so offended the philosophers that philosophical journals were finally closed to him.

He was as interested, perhaps, in the slavery problem in the United States as he was in medicine, and he advocated a system of gradual emancipation of the slaves. His discovery about the nervous system was that there were four kinds of muscular action. The first kind he calls voluntary, that is, a man decides that he is going to do something and he does it. The decision is what Hall called volition and, on the presumption that an individual can freely will the voluntary muscles of the body

MEN AGAINST MADNESS

to follow his orders, such muscles are those of the trunk, legs, arms, and head, which determine how he is going to turn, where he is going to walk, and what he is going to say.

The second kind of muscular action, he said, was respiratory. A person can decide whether he is going to breathe or not, that is, he can hold his breath, and in that way his action is voluntary. But beyond that, when the subject pays no attention to his breathing, or if the nerves going to the diaphragm are cut, he still could keep right on breathing mechanically.

The third kind of muscular action Hall called "involuntary," the kind that one finds in the movements of the stomach, which one cannot control by the will, but which are controlled by a separate part of the nervous system. He pointed out, however, that there was a fourth kind of nervous reaction which is somewhat different from all the previous kinds and does continue when both the voluntary and respiratory movements have ceased. The first three kinds of muscular action were known only by actual movements. The last kind existed as sort of a continuous muscular action, such as keeping the throat open for breathing or the rings of muscle about the rectum, for instance, tightly closed. Localizing these various functions, Hall pointed out that the cerebrum was the source of voluntary motion; the medulla oblongata (which is a continuum of the cerebrum, joining it to the spinal cord) was the source of respiratory motion—and, we might now add from our increased knowledge of these things, the source of heart beat; the spinal cord was the center of simple reflex functions, like drawing away a limb quickly when it is burnt or pinched, and a sympathetic nervous system which was the source of nutrition by the use of involuntary muscles.

After Hall had published some of his findings, he began to come into a sharp conflict with some of his contemporaries. One Dr. John D. George, president of the Medical Society of

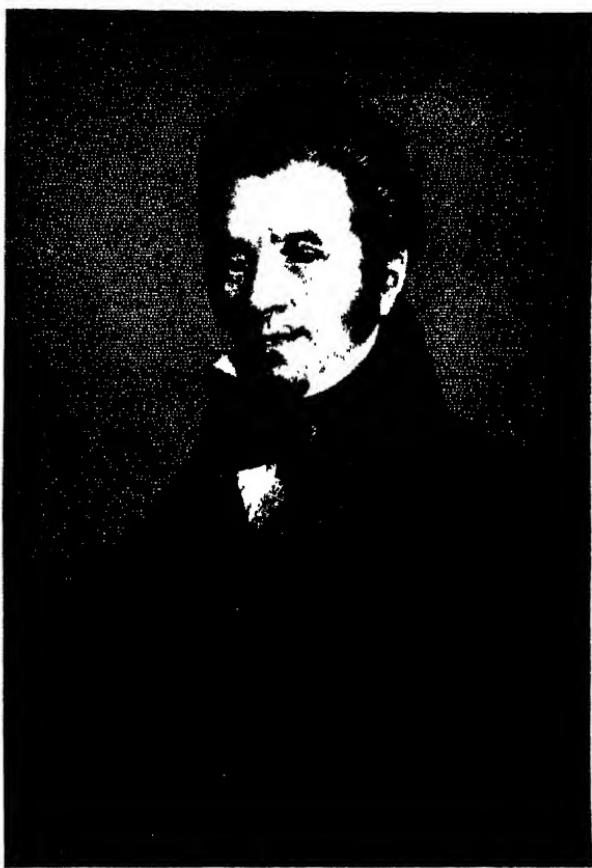


Plate XXV

MARSHALL HALL

"QUACK" NUMBER ONE—GALL

University College, London, read a paper on the history of the nervous system before that body. He tried to show that a man by the name of Prochaska had anticipated Hall. He culled from various writers a number of extracts which would prove that Marshall Hall's contributions were not worth considering.

"I have written it [my paper]," he said, "because it appears to me that we cannot be too strict in awarding to every individual the credit to which he may be entitled by the facts which his industry has accumulated, or the laws which his ingenuity has inferred from them; while, apart from this *suum cuique*, an imperfect history deprives the mind of the pleasure which it feels in tracing each principle from its origin to its end—from the first shadowing forth of the idea to the latest detail added to the system . . . although my present conclusions are not altogether pleasing, for I am convinced that if more had been read, less would have been discovered." A rather nonsensical sort of statement, not particularly logical, but one which set off a good deal of dynamite. It was not long before comment was made in one of the papers, in 1838, that Marshall Hall was completely anticipated by Prochaska, and local physicians seemed to be happier to find out that he had been anticipated than to take some glory for England.

But it was almost impossible for Hall's contemporaries to keep from taking a few dirty little digs at him. They found that he was the one person who had most frequently borrowed Prochaska's little volume, consequently he must have plagiarized from it. Hall took the most reasonable means of meeting this argument, by getting a certificate from the librarian stating that he had used this volume only in the years following the publication of his own findings, but nobody paid any attention to him. Part of this controversy undoubtedly was due to the fact that Marshall Hall was an opinionated sort of fellow, and that he did take more credit to himself than

MEN AGAINST MADNESS

'perhaps he deserved. But we must admit that, from our stand-point today, his idea of linking up all the parts of the nervous system and showing that the reflex arc requires the intervention of the spinal cord or some higher center, was a very important contribution.

Let us return, then, to François Magendie. He was physician to the Hôtel Dieu and Professor of Medicine at the Collège de France. This institution was founded by Francis I with the desire to neutralize the more rigid teaching of the University in the Sorbonne. There was much more freedom of thought there, supposedly no limit to the type of teaching that could be carried out. Jacques DuBois, we mentioned, held a chair at this institution for some time. It was during the period that Magendie held this post that Bell and he were having their controversy. A great student and a thoroughgoing investigator, he did not, however have the ability to generalize broadly like many of his contemporaries, but he did produce many isolated facts. He published the first journal in French to be devoted exclusively to physiology. His exposition of his discovery about reflex laws was probably his greatest writing on any subject, but his fame depends on something greater than his ability to write. He was the discoverer of Claude Bernard.

While Claude Bernard produced nothing directly applicable to psychiatry and neurology, his greatness in physiology and some of his research methods make him of interest to us. He was a fascinating individual, tall, handsome, with the appearance of really a great man and a distinguished person. Wherever he went, he was noticed. Besides that he was a wonderful technician. He could operate better than any of his contemporaries, and this ability was early recognized by Magendie.

Claude Bernard was born June 12, 1813, in the little French village of Saint Julien in the department of the Rhône. His

"QUACK" NUMBER ONE—GALL

father was a humble proprietor of a small estate and earned a living as a winemaker. At an early age the lad was taken in charge by the curé, who made him a choir boy and taught him Latin. Soon afterward he went to the college at Villefranche, which was under Jesuit direction. When he seemed to have gotten as far as possible in that college, his family by making every effort sent him to the University of Lyons, where he studied none too hard, and where he remained only a short time. Since his father was not particularly wealthy, it appears that it was necessary for Claude to go into business quickly.

Claude, in his late "teens," obtained a job in a pharmacy, where his brightness and alertness quickly made him popular with the proprietor. He was allowed to make up prescriptions and to dispense medicines, including many prescriptions which were formulated for the animals in the veterinary school.

It did not take Claude, essentially an honest chap, a long time to realize that he was a bit over his depth, and that he had best get out of pharmacy as soon as he could. The work awoke a healthy skepticism within him and he chafed under the harness that kept him thus occupied. Finally the breaking point came.

One of the most popular remedies in the neighborhood was a syrup, or tonic, which all the good burghers would order, and which had an excellent effect. In common with our proprietary-medicine users of today, no one thought of asking what its ingredients were. Suffice it to say that those who took this syrup, or tonic, were cured and the demands for it became tremendous. It was the composition of this stuff that disillusioned Claude Bernard. Whenever any medicine would spoil or would be on hand too long so that the proprietor knew that there was no chance for a sale, he would

MEN AGAINST MADNESS

tell Claude to put it in the syrup. Thus this substance that was so splendid in its health-giving properties really had no justification as a form of scientific treatment.

About this time Bernard began to take an interest in playwriting. He wrote a vaudeville comedy entitled "La Rose du Rhône" which had considerable success when presented, although it has never been published. He went on to write a historic play in five acts, which inspired him to leave for Paris. Two friends and he decided that Lyons was too small a place for geniuses like themselves. They said good-by to each other, resolving that they would meet in Paris when they became famous.

It is reported that they met by chance in front of the Pantheon where the words are inscribed, "In Memory of the Greatest Men of the Nation," and this statement, strangely enough, applied to them. Bernard was undoubtedly to become the most famous physiologist of France, the second became a Bishop, and the third a director of railways.

Bernard's successful little vaudeville comedy had enabled him to earn just enough money to get him to Paris. Armed with a letter of introduction to the great critic, Saint-Marc Girardin, from a member of the faculty of the University of Lyons, he betook himself to the great city. His five-act play, which really was excellent, was carefully read by the critic; but somehow or other he saw in Bernard a personality which had more in it perhaps than just playwriting. When Bernard returned for the critic's evaluation, Monsieur Girardin told him that in his opinion the play was excellent, but he said: "You should make playwriting merely an avocation. If you do not, you will starve. I will admit that your play shows some promise, but not enough, perhaps, Monsieur Bernard, for me to tell you to devote your whole life to playwriting. You've had some experience in pharmacy. Why

"QUACK" NUMBER ONE—GALL

don't you study medicine? If you do, you will have a much surer means of making a living."

Bernard, although somewhat discouraged, followed this advice and entered the university. He was poorly equipped in the way of funds, but he lived most frugally with another man. His residence was a garret where the men ate, slept, and even cooked. Occasionally when a fowl had been sent from the country, Bernard would borrow utensils and he and some friends would have a real feast.

But Bernard's sincerity and energy, which he had already shown in rejecting his pharmaceutical avocation, would not let him rest. He worked hard at the university, in fact so hard that we have no more indication of his showing much interest in literature. We might note that his unproduced play was published after his death, and many who read it considered it to have excellent potentialities. Because of the fact that there were some references made in the introduction to the desertion of Bernard's wife and daughter after he had become old and needed their attention, threats of libel made the publishers withdraw the play from circulation, and it has become a rather rare collector's item.

When Bernard began his medical studies, he apparently set himself forward toward a career as a surgeon. This was not, of course, unusual. Even today many of our medical students decide on surgery because it looks like an excellent means of livelihood. Contemporaneous physiology attracted but few. The science was largely didactic, and it was obviously wrong in many respects. When professors were making a speech or lecture about physiology, the things that they said were obviously untrue even to such an immature student as young Bernard. He studied assiduously. His dissections were excellent, and he learned a great deal about anatomy.

MEN AGAINST MADNESS

When he had the opportunity he learned as much physiology as he could, but he couldn't stand the boredom of the lecture. Lecturers in Paris usually were quite didactic. They would stand in front of their students and describe, explain, and discuss the various physiological features which they happened to know, but they permitted no interruptions, no questions, and no discussions. Anyone who has been to a course of lectures, whether it be in a university or in a town-hall series, where the instructors are more interested in their subject than in selling themselves to their audiences, can imagine pretty thoroughly what the young student in Paris in those days was up against. Words, words, words poured out of the mouth of the instructor—nothing inspiring, just drab descriptions. The listless attitude that Bernard developed while attempting to listen to these lectures was responsible for the fact that he did not rank very high in his studies. He was acknowledged, however, as a bright man and an excellent student and, beyond that, a first rate dissector. In fact his dissections were so good that he, in partnership with another student, opened an experimental laboratory in the hope of gaining some money through student fees, with the possibility also that he might be able to do a little research and experimentation on his own initiative. So few students took advantage of this laboratory, however, that the two friends were forced to close down, for they could neither pay the rent, nor pay for the rabbits which were so necessary for a physiological laboratory.

At the end of Bernard's fifth year, he was appointed as interne at the hospital. It is said that Magendie selected him, but this seems doubtful for Magendie showed at first that he had but little use for him. But whether he was selected by Magendie himself, or whether he was assigned to him, he

"QUACK" NUMBER ONE—GALL

reported for work and did conscientiously whatever he was required to do.

Magendie's attitude was unfair. He was rude, abrupt, and contemptuous. He paid almost no attention to his new interne, and it seems to have been some time before he even knew Bernard's name. It was not long, however, before Bernard's remarkable ability to dissect served him in good stead so that, one day after watching him, Magendie called out in rather a nasty way to him, "Say, you, I want you to be my préparateur at the College de France."

Naturally Bernard was glad to get this appointment. First of all, it gave him some standing in the community, for until that time he was merely an unidentified interne; furthermore, since his family was impoverished, there was no question that the small emolument that came with this position meant a great deal to him. In this manner one of the greatest physiologists that the world has ever seen got his start.

Physiology at that time had just begun to recognize the significance of the many chemical and physical discoveries which had recently been made. The facts about the interchange of gases, the laws of absorption, and many of the other findings of physics were being integrated into physiology. There was so much that was unknown that even Magendie had the idea that, while it was true that there were a number of actual physico-chemical processes which were responsible for the living being, on the other hand there were a number of processes that one couldn't understand, and these were dependent upon some "vital principle." It was to be Bernard's contribution to take the philosophy and the mysticism out of physiology and make it a science which closely resembles physics and chemistry in its logical construction.

As I have said, by being appointed to his new post by

MEN AGAINST MADNESS

Magendie, Bernard really was started on his career as a physiologist. In addition to his duties at the Collège de France, he was permitted to devote some of his time to the delivery of private lectures in order to support himself. When he was not actually working for Magendie or lecturing, he spent his time in his own laboratory. It was not unusual in those days to find him experimenting in a dark cellar somewhere, or in a corner of a laboratory far from the department of physiology. Bernard's early experimentations have no particular bearing upon the nervous system, but he did show how foods are digested—a great contribution to learning. He founded, in other words, the basis of our modern physiology of digestion.

For instance, he showed that there are juices in the pancreas, which he withdrew from a living animal, and which, when placed in a test tube with meat or with fat, produced a chemical change into simpler substances that the body could absorb. It is easy to see how important such a discovery was, for it meant the difference between knowing nothing about what happens to the food after it enters the body, and beginning to get an idea of how the juices of the stomach and intestines work in order that food may be made available to run the complicated human machine. But more important than these discoveries were two others, concerning groups of facts which Bernard studied during the course of his whole life. The first was the discovery that there are certain materials generated by glands, such as the pancreas and other structures—he was somewhat doubtful about just which ones they are—which enable the body to handle these chemicals into which the food is broken down. We know today, for instance, that one part of the human pancreas secretes a substance which we call insulin. When this is thrown into the blood, it enables the muscles to burn the sugar which has been absorbed



Plate XXVI

CLAUDE BERNARD

"QUACK" NUMBER ONE—GALL

through the intestinal wall. This sugar, in turn, has been previously broken down by digestive juices from starch in its various forms, whether it entered the mouth looking like cake or like pie. Chemical substances of this kind were not even envisaged in the body, yet Bernard pointed out the existence of chemical changes of this nature, and perhaps for this reason he is called the father of endocrinology, because these glands, like this part of the pancreas, have an internal secretion.

The second thing that Bernard discovered was the fact that certain nerves which arise in the brain control the blood vessels. It was known that there are certain muscles in the body which have nothing to do with voluntary movement. Hall pointed this out, but it was probably recognized before his time. Certain of these muscles, like those in the stomach and the intestines, move in a wavelike form, and the researchers thought that this movement was spontaneous.

Scientists in the middle of the last century had no hesitancy in using the word "spontaneous." Wine fermented for some "spontaneous" reason; muscles contracted—if they were not under direct control, like those of the arms and legs, they did not result in voluntary movement—and the movement was "spontaneous."

The great German physiologist, Johannes Müller, proposed the question whether there might not be involuntary muscular tissue in the arteries, and asked whether, for instance, they do not contract when weather is cold and whether they do not expand when there is heat, for we see a person who is very hot flushed, and a cold person very pale. Other researchers showed that there was to be seen under the microscope something in the arteries that looked like intestinal muscle, involuntary muscle that could not be controlled by the will. It had been proposed already that there was such a nervous

MEN AGAINST MADNESS

system as the sympathetic, long strings of which lay in front of the bony vertebrae. These strands did not pass down in the hollow space inside of each vertebra within the spinal canal which contains the spinal cord, but were a sort of knotty chain, one on each side of the front of the vertebral column, and they tangled up in a sort of web-like structure, which is called a plexus. The nerve tangle in the abdomen is the "solar plexus." Sympathetic nerves had been observed, but their relationship was not known until Bernard cut one in the neck.

One day he cut what is known as the cervical (neck) nerve on one side, in a rabbit, and the temperature of that side of the head and neck, instead of falling, rose. As a matter of fact, he found that the increased temperature was quite marked in some cases, and, if he removed one of these knots, known as a ganglion, the rise in heat was even greater. He did not realize at first that what he had found out was that there is a nerve controlling the blood vessels, and connected with the brain. Other observers had noted that the same nerves constrict the eye pupils.

What Bernard found, then, was the fact that the brain, through the sympathetic nerves, is able to control all these involuntary muscles. He found, in this particular case, that cutting the sympathetic nerves paralyzed the arteries, thus affecting the blood pressure.

When one has to deal with a relatively uninformed public, one realizes how important the question of blood pressure is. Some people will go to a physician just "to have the blood pressure taken." Physicians today know that a blood-pressure reading alone is not of great importance, although it is a useful fact. It is very important sometimes, of course, to know about a patient's blood pressure, but had Bernard not done his work, had we not learned that there is a nervous effect

"QUACK" NUMBER ONE—GALL

on blood vessels and that the nerves do affect all these involuntary muscles, it is easy to visualize that our knowledge of physiology as a whole and our knowledge of physiology of the nervous system would be in a state today where we could practice but little of our modern medicine.

It is beside the point here to discuss many of Bernard's other subjects. He investigated poison. He was interested in the carbon dioxide in the blood, and he did a great deal of experimentation on this, with animals. It was perhaps his technique and his inspiration which later on moved other researchers to do studies on brain physiology which today give us a much better idea of that organ of the body than we ever had before.

In contradistinction to many of the others who are discussed in this volume, Bernard remained relatively popular up until the time that he became fairly old. When he was quite young he married a woman more ambitious to see him make a living than to see him make wonderful discoveries in physiology. Finally she left him, taking with her his daughter who in later years had nothing but contempt for her father, a contempt which he did not deserve. In 1863 Bernard developed an obscure malady which affected him for some time. While he was ailing he wrote a book called "Experimental Medicine." This is one of the greatest classics of all time, but one which has been ignored by many otherwise enlightened practitioners of medicine.

Even today many of our local doctors practice a sort of witch-doctoring. They have learned certain rules about prescribing for any disease. If a patient has pneumonia, they immediately order medicine A, medicine B, or medicine C. They may vary the doses, but often they do not. Claude Bernard laid a foundation in science to get away from all this. He said that one should know the environment of the animal;

MEN AGAINST MADNESS

what is happening to him on the outside; what is happening to him on the inside; whether he is undergoing certain chemical changes; whether his lungs are changing because of the inroads of some sort of chemical. Since germs were not known then, he could not ascribe disease to them, but the one thing that he preached was "look, look, look." He demanded that if one wanted to know the function of an organ, one should either stimulate that organ, or one should remove it, or at least remove it in part and then closely observe what happens to the animal. A researcher should use every precaution to keep from misjudging, and should not go into experimentation with any preconceived ideas.

If all doctors would do that today, a few of the skeptics that we have to contend with would have less to argue upon. It must in all fairness be admitted that the medical schools do argue for this type of practice. I think that one of the most sensible passages in the history of medicine, and one which has served to put psychiatry on its feet and will memorialize Claude Bernard, is the following:

"But no one in the present state of biological science can pretend that physiology is able to supply complete solutions of pathological problems; we must ever strive to solve these problems by physiological inquiries, for that is the true scientific path; but we must carefully guard against the illusion that we have already gained the solution. Hence, the prudent and reasonable course at the present moment is to explain all that part of disease which can be explained by physiology, and to leave that which we cannot so explain to be explained by the future progress of biologic science. This kind of successive analysis, which, in its application to pathological phenomena is carried only so far as the progress of physiological science permits, isolates little by little, by way of elimination as it were, the essential element of the disease

"QUACK" NUMBER ONE—GALL

which is thus being studied, lays hold of its characters of greater exactitude, and allows therapeutic efforts to be directed with greater certainty. Besides, with progressive analytic advance, the proper character and physiognomy of the disease are preserved. But if, instead of this, some delusive approach of physiology and pathology gives rise to the ambition to explain prematurely at one step the whole of the disease, then one loses sight of the patient, one gets a wrong idea of the disease, and by a false application of physiology, experimental medicine is hindered instead of being assisted in its progress."

If the firm adherents of Freudian psychology would temper some of their findings with Bernard's teachings they might perhaps find that we are on the verge of the next step in psychiatry. I shall refer to this further when we touch upon Freud's contribution to the battle against mental disease.

In the summer of 1864 Bernard's health improved sufficiently so that he got back to Paris. He had been hibernating in the little estate which had belonged to his father, where he liked to return again and again because it was so peaceful. As he had always been rather unaggressive, a trait which he had in common with many of the other celebrities whose lives we are reviewing, Bernard, although not exactly timid, was unlikely to push himself forward. He had not found any need to mix socially. His laboratory kept him busy, and he was achieving one goal after another in the advancement of knowledge, so that his life was very happy and very satisfying. As a matter of fact, he tried to avoid social distinction and marks of favor at the hands of those in high places. Many of his friends had become important and could have made "contacts" for him. He had close personal relations, for instance, with Henry St. Clair de Ville, who at that time was

MEN AGAINST MADNESS

one of the Emperor's closest friends. But Bernard was a rugged farmer boy and, withal, a scientist, and the temptations of society were not for him.

But for a while all that was changed. The Emperor, Louis Napoleon, who attempted to be a politician, and whose methods were somewhat different from those of more securely seated kings, made every attempt to obtain the good will of national celebrities, particularly men of science. One day he invited Bernard to attend some festivities, and his invitation naturally was accepted. One does not usually turn down the Emperor's invitation. In company with Pasteur he went, and, meeting the Emperor, had quite a discussion with him. The Emperor at that time was emotionally tied up with spiritualism and, finding that Bernard was a pretty reasonable individual and was able to discuss with authority so many things about the nature of the human body and about his discoveries, the Emperor was fascinated. As a matter of fact, most of the people at that particular meeting were quite annoyed because of the fact that the Emperor kept Bernard at his side for two hours and dismissed rather curtly anybody else who wanted to intrude. And he finally came to the conclusion that Bernard was a really great man. Scientists had recognized that fact before the politicians; and the longer the interval of time since his death, the greater we realize that he was indeed great.

But, different from many princes, Louis Napoleon immediately sent for his Minister of Public Instruction and told him to see that Claude Bernard had everything he wanted. A few days afterward, the minister got in touch with Claude Bernard and asked him what he would like to have done. Bernard, of course, said that he wanted nothing for himself, but he did think that a good physiological laboratory ought to be established. In response to his request, two well-equipped

laboratories were set up, one at the Sorbonne, and the other at the Museum of Natural History. From then on, Bernard's life was one of honor and of importance. He was admitted to the French Academie and was made one of the "immortals." In 1869, the Emperor made him a member of the Senate but, since there was a trifle of political difficulty in France in 1870, Bernard had little opportunity of occupying his seat. Strangely enough, in spite of the fact that he had made such an impression on the Emperor, he was considered to be anything but a politician, so that, when the Republic was restored, he had no trouble in becoming very friendly with the new leaders.

One of his daughters was so estranged from him that she became an anti-vivisectionist in order to atone for the "crimes" which her father had committed. But he was brilliant and beloved, and many of his students, as we shall see, in turn became great because of the inspiration he gave them. There was a great personal attachment between him and his students, and it was not because of his importance, but because of the kindly and benign way he treated them.

In 1877 he began to make some experiments on the fermentation of the grape and on what virtually amounted to his death-bed he told his pupil, D'Arsonval, that he thought he had discovered why fermentation occurs. It was D'Arsonval who discovered the device for measuring minute quantities of electric currents, a device which we use today for thousands of different things. Some results were published after Bernard's death, and appeared to be contrary to the findings of Pasteur. As a matter of fact, Pasteur felt that Bernard's remarks on fermentation set back his, Pasteur's, work many years. Yet some of the ideas on this subject which Bernard indicated in his last papers, and with which Pasteur differed, were found to be true many years after Pasteur's work was

MEN AGAINST MADNESS

completed. So, almost up to his dying day, Bernard was aiding science to make great steps forward. His death in 1878 depressed all of Paris. He was beloved by Parisians, he had few enemies, and he was given a state funeral of the very finest kind—the kind reserved for only soldiers, sailors and statesmen.

One could scarcely obtain a complete idea of Claude Bernard's work without knowing something of the work that was done by his successor in the chair of physiology in the Collège de France, Charles Edouard Brown-Séquard. Brown-Séquard was one of the most eccentric individuals in the history of physiology. Hughlings Jackson we might perhaps consider an eccentric, but he didn't compare with Brown-Séquard. Every time that Brown-Séquard would get into a little trouble, he would take an ocean trip and settle down in a different country. When he advised Hughlings Jackson to go into neurology, he was practicing in London, Paris, and New York at the same time, an achievement which I doubt has ever been duplicated by another physician, and yet, strangely enough, he was not particularly interested in money. He had a snipe-like restlessness, and was always in such a jam financially that he had a psychological need to keep up these offices in order to keep in touch with the people in the various countries where he happened to want to practice. He was born on the Île de France (not the French liner but Mauritius, the French possession). Strangely enough he was an English citizen, although he was always believed to be a Frenchman at heart.

Very much like Claude Bernard, after he had had his early schooling, which he got at a sacrifice—his mother being a very poor woman, and his father having died in a shipwreck before the lad was born—Brown-Séquard felt that he was going to be an author. In 1838 he persuaded his poor mother to

"QUACK" NUMBER ONE—GALL

accompany him to Paris. (Claude Bernard had done similarly before him.) He submitted some of his writings to Charles Nodier, a great litterateur, who treated him very much in the same way as the dramatic critic had treated Claude Bernard. This critic advised him to go into something else, rather than to take to writing as a means of livelihood.

So Brown-Séquard turned to medicine, with all his heart and soul. He developed, for instance, the habit of going to bed at eight at night and getting up at two in the morning to work. When his mother died in 1840, he was just recovering from an infection which he had acquired while doing a dissection. So he returned to Mauritius for a time to recuperate, but he couldn't stay away from Paris, whither he returned to complete his work for a doctorate in 1846. A few years later he made a wonderful discovery, one which was to be of extreme importance to Jean-Martin Charcot in determining that the symptoms of the hysterical patients are not caused by damage to the brain.

He showed that if one side of the spinal cord is severed so that the connections from the brain to the body are intact on the other side, but disconnected on the injured side, sensation is lost on the uninjured side, while movement is lost on the other. To put it differently, the person is paralyzed in his right leg if the right side of the spinal cord is cut, but he loses sensation in his left; that is because the sensory pathways cross in the cord, while the motor connections cross higher up, just before they enter the brain, for, as we shall see in discussing Hughlings Jackson's work, the left side of the brain has mostly connections for the right side of the body, and vice versa. The hysterical patient, we find, since he knows nothing about such a highly technical point of anatomy, is always both paralyzed and anesthetic on the same side. This, according to Brown-Séquard's work, is almost impossible, if

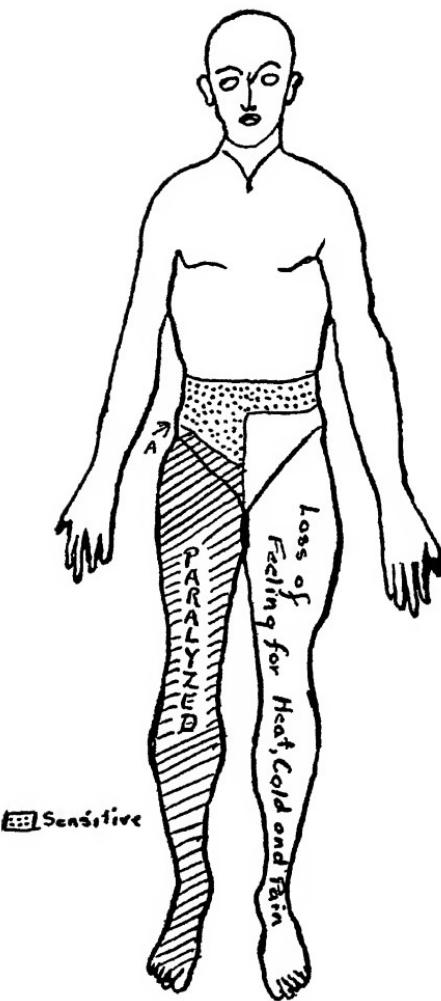


Plate XXVII

BROWN-SÉQUARD'S SYNDROME

Although the spinal cord is injured on the patient's right side, causing paralysis on the same side, nevertheless, the opposite side and the area above the paralysis are also affected.

"QUACK" NUMBER ONE—GALL

the paralysis or anesthesia be due to destruction of one side of the cord resulting from injury or disease.

Later he supplemented the work of Claude Bernard, developing a very valuable accessory technique. Where Bernard showed that, by cutting the nerves supplying the blood vessels in the sympathetic system, one gets dilatation of the blood vessels (flushing) because the impulses controlling the blood vessel are not coming from the brain, Brown-Séquard showed, by pinching or irritating the nerves below the cut (on the end of the cut nerve toward the blood vessels), that the blood vessels can be made to contract, thereby proving very definitely that there is a control of blood pressure by the brain.

In 1852 he made his first trip across the Atlantic. At that time he had no knowledge of English. For political reasons it was necessary for him to get out of the country with no waste of time, however, and he had very little choice but to get going. He had been a rabid Republican. In that year Napoleon III had ascended the throne, so all Republicans who had shown their colors as freely as Brown-Séquard were very much suspect. Arriving in New York, he made a living as best he could by carrying on physiological research, teaching French, and doing some second-rate obstetrics. He charged only five dollars a delivery. Even at that time he was a prolific writer, and collaborated on a work in obstetrics. His emotional ties with the United States arose from the fact that his father had been an American, and we find again and again examples of his subconscious Americanism. On that trip, he married the niece of Daniel Webster.

But the wanderlust had gotten into his blood; he couldn't remain in the United States, so he returned to Paris. We find him, after helping to control a cholera epidemic in the île de France, less than a year later returning to the United

MEN AGAINST MADNESS

States, where he settled in Richmond, Virginia, to be a professor of physiology. He was unable to get along with the faculty. There wasn't enough freedom of thought and of research; there had not yet been developed enough recognition of true principles of physiology. The United States, after all, until the present century has been rather backward in its pure science.

So he returned to Paris and shared a small laboratory where he took students, until four years later, when he gave a course of six lectures at the Royal College of Surgeons in England on the "Physiology and Pathology of the Central Nervous System." Here he was so successful that arrangements were made for him to continue to lecture in Edinburgh, Glasgow, and Dublin. England then attracted him, and Brown-Séquard was one of the original physicians in that institution when the National Hospital for Paralyzed and Epileptic at Queen Square was opened in 1859. It was at this point that he advised Hughlings Jackson (soon to be discussed) to enter into the special investigation of the diseases of the nervous system.

In 1864 Brown-Séquard felt that his private practice was interfering with his research work, and, aided by the appeal of his wife to get out of England and to return to the United States, he accepted a new and special appointment as Professor of Physiology at Harvard University. He intended to stay in Cambridge permanently, but when, about three years later, his wife died he again ran from his environment, returning to Paris where he met Charcot. Joining with Charcot, he founded an important scientific magazine and entered into many controversies with his partner about some of his theories of causation of disease. Probably Charcot was right, and at any rate the two remained fairly good friends. Just before the Franco-Prussian War, Brown-Séquard bounced back to America where he remained until the war was over, in the

"QUACK" NUMBER ONE—GALL

meanwhile marrying another American. She, his second wife, lasted only two years.

About this time he began to get a little too sure of himself, and commenced to debate rather than to lecture. He even criticized the attitude of the surgeons in England, so that his reputation began slightly to decline.

Soon after marrying his third wife, the widow of a painter by the name of Doherty, in 1877, he accepted the chair of Physiology in Geneva where again he had planned permanently to settle down.

But in 1878 Claude Bernard died, and when a search was made for Brown-Séquard, to replace him, the wandering professor was again found in America and was brought back to take the vacant professorship at the Collège de France. Some difficulty arose, however, because it was found that he was not a citizen of France. He was an English citizen and, although it was discovered that he had taken out French citizenship at another time, this fact had never been established. However, certain arrangements were made so that he could hold the professorial job.

About this time he was starting to decline physically to a considerable extent. He was sixty-one years old, and showed his age. After all, he had worn out three wives and had exhausted the financial and research possibilities of three countries. Following Bernard's lead about gland secretions, in 1869 he had suggested that injection of semen into the circulating blood of old men would whip them back into shape. So in 1889 he injected himself with testicular juice and some other substances, which had an amazing effect. When he appeared before audiences to lecture, they could not believe that he was seventy years old, as he claimed to be, for he looked twenty years younger. In fact, he looked younger than he had when he was sixty.

MEN AGAINST MADNESS

This to us in mental medicine is the most interesting part of all his work, for while his studies of brain pathology and physiology were important in an understanding of organic disease of the nervous system, nevertheless we are learning now that the glands of internal secretion which he and Bernard first pointed out are of vast importance in an understanding of character. In fact, injections of them are used to treat certain mental diseases, which will later be discussed. It was he who first took an extract of one of these glands of internal secretion, injected it into a patient (who happened to be himself), and obtained surprising results. Scoffers have said that he really was rejuvenated more by suggestion than by any actual effect of the testicular extract. However, shortly before he died he had whooping cough, truly an indication that some of his youth had returned to him.

THE ORGANIC APPROACH

LET us return to one of the contemporaries of Magendie. In 1825 there was a brilliant young man by the name of Jean-Baptiste Bouillaud, who had been born in 1796, and who became very active and very important in the medical field. Bouillaud was distinctly a disciple of Gall. He followed the master's teachings and believed in almost everything that he said. And strangely enough, he happened to be a very thoroughgoing scientific fellow. So far as he could verify the things that Gall had said, he did so. Autopsies and post-mortem examinations were beginning to be done more frequently.

There is, of course, a reason why it was necessary that autopsies be done really to understand the working of the body. A physician is called and comes in to examine a patient very carefully. He finds that there is something the matter. By reading what others have found and what others have thought on the subject, he forms some sort of impression, but he knows that there is only one way that he can find out just what has gone wrong, and that is, to "get into" a dead human body where the trouble was similar to that of his patient—and see what went wrong. This type of study had been advocated from the time of Aristotle, but it could not be effectively carried out until the last century, partly because of superstitious resistance, but largely because there was very little

MEN AGAINST MADNESS

that could be found out upon post-mortem examinations. Since the microscope had not been fully developed, one could not find that there was anything particularly the matter unless the damage was, as in apoplexy, so extremely great that it could be seen with the naked eye. Unfortunately for study, but fortunately for the patient, in most mental diseases or diseases of the brain and spinal cord, the damage is not as bad as that except that in occasional diseases, particularly tumors and cysts, there are large destroyed areas. Earlier in this volume, we pointed out that students could also at times see where there had been a hemorrhage, and knew what part of the brain had been attacked, but that was as far as matters could be gone into.

But Bouillaud maintained that to some extent Gall was right; that the front of the brain is where there is a center for speech. One of Bouillaud's arguments to show that there is a special center for speech and that there may be special centers for other activities lay in the fact that a person might lose his speech and yet be able to walk, move about, and have no paralysis whatsoever. In other words, if the brain were completely damaged, as Flourens maintained it would have to be to do away with speech, not only would speech be destroyed but so would all other functions. But Flourens, he maintained, was wrong. There must be small centers. To back up his argument, he pointed out that if one looks at the brain of persons who have had an injury or a hemorrhage, one finds that the symptoms are different, according to the different parts of the brain in which the hemorrhage or injury occurred—if, perhaps, the right side of the brain has been injured, there is paralysis on the left side of the face. But science was not quite ready for such a direct argument, so Bouillaud merely pointed out that different results occurred in the body with different types of damage to the brain. The

THE ORGANIC APPROACH

idea of damage to definite parts of the brain resulting in consistent bodily changes was not developed until later. But he did not make the same mistake that Gall did. He backed up his opinion by the observation of many cases.

His argument was that, if the "principal law-giver of speech" is found in the front part of the brain, it would be necessary, if the damage were here, that speech should be more or less deranged, but, on the other hand, speech would remain if this part remained unchanged, even though other parts might be destroyed.

One of the arguments which were pressed against him was, Why, if the speech center is damaged, can the tongue still be moved in an individual who has this damage? He answered the question very simply by saying that the tongue, as anyone must acknowledge, has other functions, such as swallowing, licking, and tasting, and there is no reason why it should not continue to function automatically even though the speech function is destroyed.

Answering another argument that might be brought up—that since animals have a front part of the brain they then should be able to speak—he said that this condition is, of course, a classic instance of what he was arguing about, namely, that a lower animal just doesn't have the proper internal organs for speech.

But Bouillaud was tangled up with phrenology, and phrenology was looked upon as quackery, so, of course, he was not taken seriously.

In January, 1848, a paper was presented by a man by the name of Belhomme on the subject of the localization of speech—with particular reference to the memory of words—in relation to forward lobes of the brain. Bouillaud was a constant attendant at the meetings of the Academy of Medicine, where this paper was read, and when the matter was

MEN AGAINST MADNESS

brought up, he was right on his toes. He stood up in the meeting.

"Over and over again," he said, "I have pointed out to you people that the anterior lobes of the brain have something to do with speech. I read a paper almost fifteen years ago on this subject, and I pointed out that on several occasions I had found cases that had the frontal lobes injured and lost speech, and that in none of the other cases where the frontal lobe was uninjured was there any damage to speech. Now can you answer that?"

Dr. Rochoux arose.

"Dr. Bouillaud," he said, "I have heard you in these meetings again and again talk about localization of functions. Don't you think that you are wasting our time? After all, Professor Flourens has made his experiments on pigeons; he has carried out other experiments, and he has emphasized the fact that the brain, while a very complicated structure, acts as a whole and that there is in all probability no localization. As a matter of fact, I have opposed craniology since 1814, and I'm certain that I'm not going to believe in cerebral localization today."

Dr. Belhomme, in a tactful manner, tried to soothe the company but that did not hold Bouillaud. He arose again.

"I'll tell you what I'll do," he said, "I'll give five hundred francs to anybody here who can bring me a case of severe damage to the front part of a brain in which speech has not been destroyed."

There were no takers, but still Bouillaud's argument didn't seem to get him very far. He had, however, attracted to him a small group who continued to be interested, among them a young relative by the name of Ernest Auburtin.

At a meeting of the Society of Anthropology, a skull was demonstrated and the discussion arose as to how much intel-

THE ORGANIC APPROACH

ligence and what type of mind the possessor of that skull had had. It was a primitive skull and different from that of the ordinary individual, so naturally a great deal of interest and discussion arose. Auburtin insisted that the total volume of the brain was not a clue to intelligence, and he felt that it would be necessary to investigate various parts separately. Again he emphasized the fact that the highest parts of thought were in relation to the development of the front lobes of the brain. He pointed out a fact which had been frequently observed previously: that the results following apoplexy differ according to whether the hemorrhage was in the cerebellum and the base of the brain, or in the frontal lobe. This fact had gained acceptance by the medical profession so gradually that no one knows who first mentioned it.

The secretary of the society at that time was a young man by the name of Paul Broca, a very brilliant chap whose private life was rather colorless, but who made some discoveries which would bear description.

During the meeting one of the speakers made the remark that he believed with Flourens that intelligence and brain function were just the same things; that the whole brain acted as a single organ and intelligence was just one big function of the brain. He admitted that he did feel that there were certain faculties of mind that were linked up with special parts of the brain, just as Bouillaud and Auburtin had maintained. This so stimulated Broca that shortly afterward he made an address, discussing the importance of the volume of a brain in any attempt to decide whether the brain acts as a whole or whether it is just a group of co-ordinated organs.

For the first time a defender of Gall was able to get away with some of his comments. Broca said that, to his way of thinking, the anatomical work of Gall was the basis of a very

MEN AGAINST MADNESS

important principle, namely, that there are certain parts of the brain that are set up for certain functions. He wasn't sure that Gall's various traits, such as love of family and others, would stand the test, but he did feel that Gall was a great man, that one should not mix up his actual anatomical discoveries with the interpretations made of them by the quack phrenologists. He pointed out in this address that there were certain facts which had been discovered through microscopic study of the brain that would lead one to believe that there are special parts having special duties to perform. First of all, one could see that, in the embryo, those parts of the brain that have to do with simpler functions appear first, and that, as the brain evolves and gets larger and shows more signs of being like that of the normal adult, additional structures appear.

Two weeks later Auburtin opened another meeting of the Academy. He again stressed the theory that speech is localized in the front part of the brain and, so strong was his faith, that he offered to take back everything that he had said if any of the other members could show him just one case where there was a loss of speech when there had been no injury to the front lobes of the brain. Broca was so impressed by young Auburtin's remark that he asked him whether he would not like to attend with him a case of a man who had lost his speech.

Broca was primarily a surgeon who worked at the Bicêtre, the hospital where Pinel had made his great contribution to the humane treatment of the insane. Auburtin was quite willing. He pointed out, after hearing Broca's description, that there were some other complications in the case, that the man was paralyzed the whole length of his right side, but nevertheless Auburtin was willing to take the case as a test, for he admitted that there was a loss of speech in this man which

THE ORGANIC APPROACH

was of the kind seen with damage to the frontal lobes. On April 11th they saw this man and made the examination.

Death occurred on April 17 and the brain was brought to the next meeting of the Society of Anthropology. The opponents of localization were so strong that Broca lost his nerve. He merely admitted that he agreed with Aubertin, and maintained that he only wanted to see whether there were any regions or groups of convolutions where there was a specific kind of function.

Finally, in August of that same year, Broca gave a complete report on this case. He pointed out that the loss of speech in diseases such as this man had had, was rather more an intellectual function than just a mechanical function—that the tongue, the jaw, and the other parts of the speech machinery seemed to be perfectly all right, but that there was no sense to what the man said, or perhaps he couldn't understand what he heard. In other words, here had been discovered a psychological phenomenon, rather than merely a mechanical one. After Broca had concluded his discussion in pointing out that articulate language is different from mere speech, he said that he would do his best to find out whether there was not a special organ for just this purpose.

It is interesting to review this first case of Broca's. The patient was a last-maker who had lost his speech at the age of thirty. Shortly after that, he was admitted to the hospital of Bicêtre. He was known in the precincts of the hospital as Tam, because the only thing that he could say was "Tam, Tam," and he accompanied this word with appropriate gestures to show anger, fear, or rage. He even gave the other patients the impression that he was swearing at them with the use of this single word. Those having him in their care did not think that he was insane because he could not speak, for there is nothing on record to indicate that an attempt was

MEN AGAINST MADNESS

ever made to transfer him to the insane wards of the hospital.

About ten years after his admission to the Bicêtre, a gradual increase in his paralyses came on. First his arm was affected, then finally his leg. Both of these were on the right side. After he lost the function of his arm and leg, it was necessary to put him to bed and, because of the fact that he lay in bed for several years, gangrene set in. Broca gave him a thorough examination, the results of which we may summarize here in a few words. The right arm and leg were extremely weak. The left side, possibly owing to the fact that the man was bedridden, was not quite as weak as the right side, but was shown to have lost some of its vigor. The tongue stuck out in the midline; in other words, it was not paralyzed. The tone of the voice was natural, even though the man could say only this word "Tam"; and Broca could find nothing the matter with his larynx. In other words, the vocal cords were all right, and the muscles which moved them, so far as Broca could make out, were normal. The patient's hearing was all right, but his vision was weak. It was very hard to examine his intelligence, because he could not answer questions, but he seemed to understand everything that was said to him. He could answer numerical questions by raising fingers. For instance, if one asked how long he had been in the hospital, he opened his hands four times and then raised one finger; this indicated twenty-one years, which was correct. Broca reported that he tried to ask Tam the same question three times in a row. The second time the question was answered Tam again made the correct answer on his fingers; but the third time that Broca queried, Tam let out a hair-raising oath, which Broca said he had heard only on this one occasion from his patient.

The hospital had a good record of how the paralysis came on. At first it started with his speech center, then it reached

THE ORGANIC APPROACH

his arm, then his leg. When Broca asked him about the succession of this paralysis, he pointed first to his tongue, then to his arm, then to his leg, showing that at least he knew that much.

Broca did feel that possibly there was some diminution of intelligence. Tam claimed that he had a family even though he was known to be childless, but, after all, we must not forget that he had been in the hospital for a number of years, that he had had no intellectual stimulation. He may not have been extremely bright in the first place, and Broca showed that the patient's brain was damaged.

Let us admit that he had some sort of intellectual weakness. It is more important to know that he had lost his speech but that, although he had lost his speech, the actual machinery, so far as muscles and tongue and larynx were concerned was absolutely normal. After the man died, Broca made an autopsy. He opened the skull and there in the left hemisphere toward the front was a cyst full of some solid material which looked like gelatin, and which disturbed the brain for an area about the size of a hen's egg. He pointed out that a considerable portion of the left hemisphere had been destroyed.

More patients of a similar nature came to Broca's attention. One was an old man who died of senile debility after breaking his leg. He would answer all questions by using the French word for three, even though at the same time he might hold up fingers to show the actual numerical amount. He had four children. When asked how many he had, he said three but held up four fingers. After he died a similar autopsy was performed, and again the brain was found damaged in about the same area.

These discoveries caused a tremendous furore. The scientific world of Paris was split up. The older men were afraid of

MEN AGAINST MADNESS

Gall's doctrine. The younger men stood squarely behind Broca. But the important contribution that Broca made was to point out that there were two parts to speech, one the executive, and the second, what one might call the intellectual part. In 1868 Broca made an address to the British Association for Advancement of Science on the subject of "aphasia"—the subject which had been so dear to his heart, loss of speech, which is what the word aphasia means.

Broca pointed out that these cases of aphasia were definitely not considered insane. The men knew what they were doing, were considered responsible for their acts, but they couldn't communicate their ideas to others around them. His interesting presentation intrigued Doctor Hughlings Jackson, who followed Broca on the program.

John Hughlings Jackson was born at Providence Green, Green Hammerton, Yorkshire, on the fourth of April, 1835. His father was a yeoman farmer who at one time was also a brewer. His mother was Welsh. John had an uneventful period of education. He was originally educated in the village school of Green Hammerton, and later went to two other country schools nearby. He made the remark at one time that if he were really a success it was due to the fact that he was not over-educated, and he quoted a remark, which he attributed to the Duke of Wellington, about a certain noble lord who had been "educated in advance of his capacity." Jackson never had a chance to get a university education, and he remarked later on in life that he was just as glad that he hadn't, because it seemed to him that he might have been so mixed up with formal thinking that he would have had no time to do any original thinking of his own. Immediately after leaving school, he was apprenticed to a Mr. Anderson, who was one of the lecturers in the York Medical School. He took the prescribed course there, and followed this up by go-

THE ORGANIC APPROACH

ing to St. Bartholomew's Hospital to take more work. In 1858 he qualified as a member of the Royal College of Surgeons and was licensed by the Society of Apothecaries. He returned to York and spent some time as surgeon to the dispensary, where he remained until 1859. This was an eventful date. The National Hospital at Queen Square had just been founded; today it is probably the leading institution for neurology in the world.

It might be worthwhile at this point to draw a distinction between a neurologist and a psychiatrist. A psychiatrist is a physician who specializes in the functioning of the mind, diseases of thought, of conduct, of behavior, and of self-expression. Psychiatrists usually deal with those diseases which are classified as insanities by the layman. Formerly the chief interest of a psychiatrist was in those people who are dangerous because they wish to kill somebody, or think that people are trying to persecute them. More recently psychiatrists are dealing with those disorders which are milder, mental tendencies that compel patients to do abnormal things.

A patient might have to touch certain objects as he walks down the street or he might have had to return to his home innumerable times to make sure that the light had been turned out because he was so unsure of himself. These deficiencies are usually treated by psychiatrists.

On the other hand, if a man is shot in the brain and does not seem to be able to think as well as before, or if his speech is mixed up, or he is paralyzed, we know that damage has been done to the organ and that some part of the tissues of the brain have been injured. Then it is a case for the neurologist.

This distinction is far-fetched and I think it is worthwhile to point out that one of the reasons that we go into so much detail here about speech and the development of an under-

MEN AGAINST MADNESS

standing of the functions of the nervous system, is that neurology blends so closely into psychiatry. What, any intelligent person asks, can be the difference in its effect on society between a man who has a compulsive urge to call somebody an awful name, and one who has had a hemorrhage and swears at people going by, like Broca's man? It is a fine distinction, and yet too many psychiatrists are unwilling to be neurologists, and too many neurologists are interested in the fine points of the function of the brain and are interested unfortunately only in paralyses and the signs of gross damage which has been done to the brain in certain cases.

Hughlings Jackson we might classify as a neurologist, but some of the work he did was so important to the psychiatrist that it is worth while to spend time in giving a little outline of his life.

When in 1859 he went to the National Hospital with a note of introduction to Sir Jonathan Hutchinson, he had just about made up his mind to give up medicine for philosophy. Is it not strange how many people we find in this little history who have made great contributions to medicine, and who, before doing their significant life's work, were tempted to turn into some other path? But Hutchinson dissuaded Jackson. He told him that he would have a much better chance of making good if he stuck to medicine. He aided him in getting an appointment on the staff of the Metropolitan Free Hospital. Sir Jonathan makes the comment in discussing Hughlings Jackson that it is a lucky thing that he did keep an eye on him because Jackson was something of a dreamer, somewhat preoccupied with his own thoughts, and it was necessary on the day of the election to the staff of that hospital—one of great importance to Jackson—for Hutchinson himself to request the quorum to remain there while he went out to bring in the absent Jackson. He jumped

THE ORGANIC APPROACH

into a hansom cab, rushed to Jackson's residence, forced him into the cab, and brought him back just in time to secure the appointment for him. . . .

When Jackson was appointed Assistant Physician to the National Hospital for the Paralyzed and Epileptics in Queen's Square, he made the acquaintance of Brown-Séquard, of whom we have spoken. Brown-Séquard, as we have remarked, was an erratic and rather peculiar sort of fellow, who at the time Jackson met him, had an office in Paris, another in London, and a third in New York. Such a connection seemed to be very good for Jackson, so that when Brown-Séquard advised him to give up general medicine and to restrict his attention to neurology, he followed the advice, and it was a happy event for those studying the function of the brain and mind that he did so.

But Jackson, too, being rather an eccentric individual, and being required to visit the hospital twice a day and also to visit out-patients at their own homes—for which he was given the munificent salary of fifteen pounds per year—decided in only a few months to resign. Nevertheless, the Managers decided to keep him on, but they relieved him of some of his more arduous duties and also of the stipend. He was on the active staff of that hospital until 1906, and even after that was consulting physician to the hospital.

The ophthalmoscope had recently been discovered by that genius of physiology, Hermann Helmholtz. This is a device which enables one to see the nerves of the eye by the reflection of light into the pupil of the patient's eye to illuminate the back of the eyeball where the retina is. The light is reflected from the retina back to the pupil and through a pin-point hole in the reflector, through which the doctor looks. The ophthalmoscope is a very valuable tool, for it early enabled the physician to see the condition of the patient's eye

MEN AGAINST MADNESS

and oftentimes gave him a clue as to the condition of the whole nervous system. For instance, suppose the patient has a number of tiny hemorrhages throughout his body, a condition which may occur, for example, in Bright's disease. The physician, looking into the back of the eye, may see a tiny hemorrhage there, giving him a clue. When there is a disease of the brain, the ophthalmoscopic findings are enormously important because, when there is a tumor growing rapidly inside of the skull, causing pressure, the skull can not expand, and the brain tissue and the nerves must be pressed out through such openings as there may be. This is particularly true of the optic nerve which passes from the brain through a little hole in the skull into the back of the eye. As the tumor grows, it presses on the whole brain, thus forcing the optic nerve against the edge of the little hole in the skull, and choking it just as one might choke a person by putting one's full weight against the back of his neck while his throat rested against the edge of a table.

Jackson insisted that anybody who had any difficulty in adjustment which suggested that there might be something wrong with his brain, should be thoroughly examined with this instrument even if he does not complain of having anything the matter with his eyes. It is true, too, that smaller nerves passing out through other openings in the skull would also be blocked, and later on in his life Jackson found out that there are paralyses of the eye muscles due to growths or changes in the brain. But that was the least of what he did.

One of the earliest things that Jackson discovered was the fact that certain diseases of the brain are definitely related to loss of movement in certain parts of the body. This very definitely crystallized the idea of localization of brain function. If, for instance, there were a tumor in the back of the brain, vision might be impaired, and tumors at the side have

THE ORGANIC APPROACH

much to do with the loss of movement of the arms and legs. But the most important thing that Jackson was to do, at this stage of his life, was to verify these facts by studying epilepsy.

Epilepsy was known to the Ancients. People did have fits, and they would fall down. They would suddenly lose consciousness, drop where they were, stiffen out, shake, and froth at the mouth; then they would sleep for a long time. Nobody up to Jackson's time had had any definite idea what its cause or causes might be. It was presumed at one time (see the first chapter) to be due to the encroachment of devils because of some bad conduct, or due to the influence of witches upon the afflicted person.

But Hughlings Jackson was able to start a whole new pathway in the study of epilepsy. He found that in a case of injury to the side of the head, the brain was damaged directly under the wound. Strangely enough, the man who had this injury did not fall suddenly in a fit as do most epileptics, but movements of his extremities began in a particular way. They occurred on only one side of the body. By observing a large number of these cases, in which the paralysis starts, with, let's say, the effect on the movement of one finger and subsequently passes over the whole of one side of the body, Dr. Jackson was able in 1870 to point out that there are definite areas in the brain connected with parts of the body. The injury is on the side of the brain opposite the paralyzed side.

Almost at the same time two German investigators by the names of Gustav Fritsch and Eduard Hitzig brought out some experimental results which verified his findings. Fritsch and Hitzig were able to stimulate the brain of an animal. Previous to their work, it was the belief of people such as Flourens and others that, since the brain is a unit, one can not show how it worked. Suppose one were, for instance, to put a drop of salt on it. What happens? Nothing, they

MEN AGAINST MADNESS

thought. Suppose one were to pinch it, nothing would happen. But when Fritsch and Hitzig passed a sharp electric current against certain areas of the brain, they found that the legs and arms moved, there were certain areas which, when stimulated, again and again produced the same results. There were, they admitted, large areas where one could shock the brain time and time again with no results; but, strangely, just next to one of the deepest grooves in the brain was what they called a "motor" area, where a part of the body was made to move by stimulation. The places on this motor area which were localized close to the midline on each side were consistently arranged from the soles of the feet, then the calves of the legs, the upper legs, and so on until the topmost muscles of the body were reached in the lowest place along this line.

Localization of function was very definitely beginning to take shape. There were, perhaps, no little areas on the surface of the brain that had to do with love of one's aunt or ability to see one tree behind another, as Gall believed, but this much Jackson and other experimenters of his day did know—that there are places which, when irritated, produce certain movements, and these areas were assumed to be connected with motor nerves.

The microscope had also come into use. Even before these discoveries about the motor area were made, it had been noticed that in this particular area the cells of the brain did not look the same as other cells; some of them were large, and this quite justifiably enabled the research people to decide that here was a difference in function.

But Jackson went further than this simple localization of functions. He interested himself in other types of epilepsy, and he came to the conclusion that what happened in the brain of the epileptic was this: Because of irritation or dam-

THE ORGANIC APPROACH

age or some other cause, many cells were stimulated at the same time. There was an explosion, so to speak. The convulsion was really due to the fact that all the motor areas tried to act at one time, instead of consecutively as in the one-sided type of epilepsy which was the result of damage in only one particular area.

He believed he found, for instance, that, after the epileptic had had a fit and was sleeping soundly, as epileptics do after a convulsion, he was almost in a state of dissolution—that all his reflexes were gone, that one couldn't stimulate them, because the nerve cells were exhausted. We no longer believe in just this sort of thing, but his formulation of these ideas was extremely important in leading more modern investigators on toward getting a better idea of the nature of epilepsy.

He had some theories about how the cerebellum worked, but these have nothing to do with the present work so they are merely mentioned to show how broad his interests were. His idea of the nervous system was that it consists of a number of levels—three at least. At the lowest level there are just simple reflexes. One touches one's finger to a hot stove and pulls it away; only the spinal cord is needed for this. This idea was something like Marshall Hall's, but Jackson progressed further than did Hall. He said that in the middle level is the motor area of the cortex, that is, there is this place on the surface of the brain which, when stimulated, produces movement, and the highest level is related to the front of the brain, where higher processes of movement are initiated. His argument was that every part of the body is represented in every part of the brain, but he did admit that some parts are directly connected, like this motor area, while others are only indirectly connected, so that injury to certain parts of the brain didn't seem to have any relationship

MEN AGAINST MADNESS

to a definite part of the body with which it was supposedly connected.

Doctor Jackson, I think, is a contrast to the personalities of many of the other men whom we are discussing. He was a quiet, rather modest individual who was aggressive only in trying to put over his theories. Perhaps he was not aggressive enough. In fact, it took so long for some of his theories to be accepted that he made the statement that it takes the accumulation of about twenty-five ideas for a new idea to be adopted into medicine. Some of the reasons why it took so long for his ideas to be accepted and adopted can be traced to his own mannerisms. He was very punctilious, very honest, and according to his associates, very kindly. He always made sure that anybody who did work for him was paid promptly—an admirable trait. He never would say anything deliberately bad about anyone, although he did have a characteristic cool attitude toward those whom he disliked, and he would say that such a person was one to whom he "would be very polite."

There seems to be a very marked difference of opinion about whether or not Hughlings Jackson had a sense of humor. If he did have one, it undoubtedly was the same sort for which Calvin Coolidge was noted. I should like to quote from the recollections of Doctor Mercier, a celebrated alienist and colleague of Jackson, which were published in the *British Medical Journal* in 1912. If this is an illustration of Doctor Jackson's sense of humor, I feel that he should definitely be classed with Joe Miller or a humorist of that sort.

"Going around the wards one day, Doctor Jackson was surprised to find one of the beds empty.

"Where is this patient?"

"He has gone out, sir."

"Gone out?"

THE ORGANIC APPROACH

" 'Yes, sir; he was discharged, cured, on Wednesday.'

"Doctor Jackson instantly turned to me: 'Put that down in the notes, Mr. Mercier. Put down that he was discharged, cured, and put down the medicine that cured him.' "

In another instance, "Driving with him in a cab, I noticed that the cab was taking a roundabout route, and asked Doctor Jackson if I should correct the man.

" 'Leave it to him,' said Doctor Jackson; 'he knows best—he is a specialist in that department.' "

But nevertheless, Doctor Jackson was a great contributor to neurology. We are prone to think of the fact that speaking is a natural sort of function for all of us. Even to the insane, sometimes, we attribute good speaking ability, but Jackson carefully studied all those cases that had trouble with their speech function, and pointed out that there were various degrees of speech difficulty, that perhaps many a man who was considered insane merely had lost some part of his speech function—he was able to think fairly well, yet could not express himself. He pointed out, first of all, that patients with aphasia, that is, inability to speak, can be divided into two main groups: One group contains patients who are perfectly speechless or who speak with such a jargon that they can not be understood. The second group are those who use words wrongly, and he pointed out that brain damage is connected with this wrong use of words. This is a point of view different from that of Freud, whose ideas on slips of the tongue we will discuss later.

Jackson also pointed out that there are all sorts of differences in the ability to carry out tasks. If, for instance, we ask an aphasic patient to bring a key, he might not know what we meant, but if we said, "Bring that long object that we turn in the door," it might mean something to him. Perhaps we should have to explain to him in various words.

MEN AGAINST MADNESS

It was also Jackson's idea that the more complex the person's thinking became the more difficult it would be for him to express himself if his speech mechanisms were damaged. This is particularly true in the sense that those words and phrases used day in and day out to acquire food or enable the individual to fulfill his simple needs are less likely to show impairment than the individual's ability to talk in terms of philosophy, engineering or the arts and drama. The layman seldom considers that writing and speech are related but they are, and Jackson pointed out that from the standpoint of the nervous system there are many features which are common to both. Man has the ability to set forth his ideas in groups of words which make sense. He forms more or less perfect sentences whether he speaks or whether he writes, and by means of these he expresses his needs, wishes, and ideas to other people.

This ability to express one's self is impaired in certain types of cases with speech defects, particularly those cases who have had a "stroke," or brain hemorrhage. Such a patient often can neither speak intelligibly nor express himself in writing. Only too often he can go through the hand and arm motions of writing, just as he can move his tongue around in licking, swallowing, or protruding it, but when he tries to speak or to write the result will be a meaningless jargon—the machinery of movement is there but the directing force is perverted. This often is not due to failure to understand, because such patients can perfectly comprehend what is asked them, but they cannot produce the responses to *show* that they comprehend. And finally, Jackson concluded that the ability to form word images, that is, to go through the thinking processes, apparently is not necessarily damaged in the person who loses his ability to speak.

Now, what do we learn from this whole business of aphasia? We learn something extremely important, namely, that

THE ORGANIC APPROACH

only too often the layman, and occasionally the psychiatrist who is careless or indifferent, is unwilling to distinguish between faulty performance due to some brain disease and faulty performance due to some emotional situation. We must not forget that, after all, the functioning of the mind is dependent upon the condition of the brain, and while we must grant that, in the case of many mental diseases, no evidence of disease can be seen under the microscope or by any other modern method of examination, we must not lose sight of the fact that it is still possible that such a disease may exist.

Of course, nowadays, the study of aphasia has progressed far beyond the rather primitive efforts made by Doctor Hughlings Jackson, but we should not be in a position today to profit by the work of men such as Henry Head and Theodore Weisenburg if Jackson had not made his original studies and had not pointed out that there is a connection between certain parts of the brain and certain abilities of speech, and that there are various forms of loss of speech of various degrees and grades, as well as characteristic symptoms.

We might just mention in a few words the work of these moderns. Henry Head studied the brains of soldiers who developed a speech defect due to war wounds. He found that there was no definite area for speech as Broca thought, although he felt that he was well on the track of finding certain connections in the brain which were constant, and which had a definite connection with speech. He reclassified aphasia, pointing out that the old idea of loss of the sensory connections or loss of the motor connections of the brain was not entirely right. The best way to grade aphasias was according to the amount of damage that was done, whether the patients could no longer put sentences together so that the syntax would be good, or whether, perhaps, the syntax might be good but the meaning might be entirely left out. I hope that the

MEN AGAINST MADNESS

reader can see how important it is that the actual ability of the brain to handle words be understood. By the insane man we have all sorts of absurd speeches made. Is it not fair to assume that this faulty "speechifying" represents brain disease?

Hughlings Jackson married his first cousin. He had a very happy married life, but was survived by no children. While his eccentricities had little to do with his ability to do constructive work in neurology, I should like to describe a few of them so that they can be compared with the mental make-up and the attitudes taken by some of the other people whose lives are included in this book. The aggressive Gall, the irritable Magendie, and the plodding and somewhat misunderstood Mesmer are types of scientists who have contributed to the understanding of mental life.

The man Hughlings Jackson is a different type. He was extremely hard to understand. Possibly some of the failures that he had in putting his ideas over were due not so much to medical inertia as to his inability to express himself effectively. He wrote and rewrote. He would write several articles on the same subject and his expressions would be so complicated, so thoroughly annotated, and put down in such detail that they would be very difficult to follow. There was no order in his writing, and no sequence. He never published a book which brought up to date all his ideas on the subject of neurology. Yet he was a man who had many friends, and his students—even today many of them are still alive—swear by him. He was a good teacher; and he was conscientious in dealing with his patients, even though he could often not remember their names. He gave everything that he possibly could to the resident physicians who worked under him. Doctor James Taylor, who wrote a biographical memoir of Doctor Jackson, tells about how Doctor Jackson sent him on

THE ORGANIC APPROACH

an errand to take him away from the autopsy room for fear that if he were there he would see where Jackson had made a serious mistake, which possibly had caused the death of a patient.

Jackson was extremely restless and perhaps this is a sign of genius, for many of our other people discussed here were likewise unable to exercise firm control of themselves—even to sit quiet. It is said about Jackson, however, that he was worse than most, that he never sat through all three acts of a play at one time, but would see one act, leave, and if he had liked it, see the second act on another night, but there is some question whether he ever returned to see the third.

He was eccentric in his handling of books. It was told of him that on one occasion, when he was about to take a train, he went to a bookshop, bought one of the cheap novels of which he was very fond, tore the covers off the book, broke it in half, and stuck one-half in each side pocket. When the salesman appeared disconcerted, Jackson commented that he realized that the boy probably considered him insane, but that really those people were insane who did not have enough sense to do what he had done.

If he were in the company of a friend and the friend mentioned some article or some quotation in a book which Jackson happened to own, Jackson would go to the book when he got home, tear out the appropriate pages, and mail them to the friend. Consequently, an admirer who bought a set of his privately owned journals, hoping that Jackson's own articles would be in them, found, when these periodicals were placed on sale after Jackson's death, that the whole series was intact except that every article that had been written by him had been torn out—probably mailed to some friend.

Truly he was an eccentric man, but a very valuable individual to science, for he showed that our ability to talk and

MEN AGAINST MADNESS

to behave normally is dependent upon brain function. He showed that the brain does function in a systematic way; and that, while in many respects the function is extremely complicated, it bears a great resemblance to the simple reflex which was the result of the findings of Bell, Magendie, and Marshall Hall.

Let us recapitulate for a moment and see where the contributions of Gall, Broca, and Hughlings Jackson have led us. In the classical period there was little understanding of just how the mind worked and, even throughout the more enlightened period of the Renaissance, there was still an idea that there was some vital force, some mysterious fluid which circulated in the mind, in the blood, or somewhere in the body, which distinguished the living organism, more particularly the human organism, from all others. The contribution of Darwin and his disciples shook these beliefs.

We are now well aware of the fact that the one significant difference between the human and the lower animals is the fact that the human being, no matter how primitive he may be, is able to talk, although the lower animals do possess many basic reactions paralleling those of man which indicate to the researcher something about the function of the brain.

Finally, when we reach the period of Hughlings Jackson, science has discovered that there is a mechanism somewhat of this sort: When a bright light is flashed, or a loud noise occurs near a person, the optic nerve or the auditory nerve connected with the eye or the ear, respectively, sends a message to the brain. Nobody, even now, knows the exact nature of this message; as I suggested, it has some electrical and chemical characteristics. In the brain it passes to a specific part. The eye has one part, hearing has another part, and some sort of reaction results presumably to benefit the subject. The person may have blinked his eyes very quickly in order to shut

THE ORGANIC APPROACH

out the bright light; he may have pulled his head aside in order to avoid an explosion which accompanied it; or his processes may have been more complicated. He may have raised his hands to his ears to shut out the sound. But whatever this process, whether it be to shut out the light, or shut out the sound, or get away from the place of the explosion, innumerable intricate mechanisms were put to work. It must be admitted that today we do not yet know exactly how those mechanisms work, but we are beginning to get a better idea, thanks to those people whose work we have discussed. The significant thing that can be pointed out is the fact that, somewhere in the brain, is a group of nerve cells which sets man off from the lower animals.

Lower animals as a rule do not go insane. It has been possible to produce symptoms something like insanity by the use of drugs. In an experiment which I once made with dogs, I found that large injections of morphine would make the dog hallucinate just like an insane person. He would see an imaginary cat or rabbit, apparently, in the corner, and would start barking at it. He would chase it around the room, then he would back off in fear. Recently a Cornell professor has produced a milder type of mental disease in a pig; by tantalizing him with an apple he finally gets the pig so discouraged that he mopes and will not make any effort to feed himself. But as a general rule, nothing like insanity or unhealthy fears occur in the lower animals, so that the discovery of the fact that there is a speech center immediately set the human being off from lower animals.

What is more important, however, is that it made it necessary for the psychologist to distinguish between what an individual should do but can not bring himself to do, and what he should do but is utterly unable to do.

In the first case, it is found, there is a loss of will and one

MEN AGAINST MADNESS

does not know whether the brain has been damaged, for the loss of will may be due to a lot of factors such as previous disappointment, fear of consequences, or an unnatural feeling of being downhearted because of life's becoming too difficult for one.

In the second case, there is damage. The patient's head has been injured, and the scientist can then progress to the next stage of his reasoning.

If it has been shown that the brain is responsible for our being able to talk, in other words for man's being different from the lower animals, we have also found that certain diseases to which humans are prone can affect the brain; and, interestingly enough, these diseases actually produce insanity.

The symptoms of paresis, for instance, which is due to syphilis, are manifold. It is necessary to describe only one type of case in order to see that an individual who has a damaged brain may also be insane. Let us take a typical case of a man suffering from paresis, and let us imagine ourselves sitting in an examining room with the psychiatrist.

The door opens and an attendant comes in with a man about forty-four years of age. He is unshaved and, while he may be dressed in rather expensive garments, these garments are not particularly neat. They look as though they had been slept in, but we know that the man has been in a hospital for several days and has had to undress at night. There are traces of his breakfast on his face. The psychiatrist looks at the man as he walks across the room, and he may observe that he shuffles slightly as he walks toward him. The patient is just a little bit unsteady on his feet, a symptom which is not entirely accounted for by the loose hospital shoes that he is wearing.

The patient has a rather fishy, bewildered look on his face and, upon looking at him closely, one sees that his mouth is

THE ORGANIC APPROACH

shaking just a little bit, a very fine tremor. He sits down, at the psychiatrist's request, and crosses his legs.

Among other observations, the psychiatrist makes a physical examination and he is able to observe the following features about the man's physical condition which set him off from other patients: first of all, from his own pocket the psychiatrist takes a small flashlight. He asks the patient to look at the opposite wall and then, covering up the eyes as much as possible, he flashes his light into one of them; nothing happens.

"What did you see, Doctor?" asks a nurse standing by.

To answer her he flashes the flashlight into his own eyes and the nurse sees the pupil get smaller very quickly.

"This man has paresis," says the doctor. "His pupils don't react. I don't need to examine him any further because this finding is pretty characteristic. Only once in many, many cases does one find that a pupil does not react to light because of any other reason than a syphilitic infection of the nervous system."

"But," he says, "we should do many more things to make sure. We should see, for instance, whether the pupil will get small when he attempts to look at a nearby object after he has looked out of the window."

The psychiatrist tests him, finds that his eyes contract, and then asks him some questions:

"How do you feel?" he inquires.

"Just wonderful," is the reply. "Never felt better in my life."

"Could you go out and play baseball?" he asks the forty-four-year-old man.

"I certainly could, and I would be a wonderful pitcher. I'll bet I could go out there and play with any professional ball club and strike them out one, two, three in order."

MEN AGAINST MADNESS

"How wealthy are you?" is the psychiatrist's next question. "I understand that you are quite a wealthy man."

The patient looks up at him and he smiles; his lips are trembling all the while.

"I certainly am, Doctor. If you have a check book here, I'll write you a nice check for your services. I certainly appreciate them."

"How much," asks the doctor, "do you think they are worth?"

"Well, I'll give you five hundred thousand dollars to start," is the surprising reply.

"Five hundred thousand dollars!" exclaims the Doctor.

"Yes sir," answers the patient, "and if you don't think that is enough, I'll give you a check for a million dollars. I gave a check to the nurse here for a million dollars yesterday. I think that she ought to buy herself a fur coat."

Now the reader may think that this is an exaggerated case and, as a matter of fact, nowadays it is not so common as formerly. Psychiatrists don't see many cases of exactly this sort any more. First of all, patients are being treated sooner than they used to be, so that these peculiar grandiose delusions don't show themselves as strongly as they did at the turn of the century. But, nevertheless, this is a fairly typical case of paresis.

Sometimes the patient is only a little bit befuddled. He is not quite aware of the date; he doesn't quite know where he is; his speech is thick, and he can't make himself understood. For instance, the Doctor might ask him to say "Methodist Episcopal." He would answer "Methodiss Epistocal" and, if he is given a more complicated sentence to repeat, he gets completely tangled up in it.

Our psychiatrist looks at his nurse and says, "You'd better put him to bed and tomorrow morning we will give him some

THE ORGANIC APPROACH

malaria treatments," and with that, except for routine tests, he has practically disposed of the case. For there is a reasonable chance that the man will not only improve with this kind of treatment, but he may get so much better that he will not only be self-supporting but all his peculiar ideas will disappear.

When one realizes that even in 1920 a man with symptoms of this sort was doomed inevitably to die in just a few years, and he would get worse in most cases, one can see what strides psychiatry has taken. But behind these strides is a history which cannot be ignored. While physiologists and clinical neurologists were trying to understand how the nervous system works, there was a group of researchers known as pathologists, who were studying disease processes in the nervous system.

These pathologists were particularly interested in seeing what had happened to the human body when disease had ravished it. In cases of tuberculosis, for instance, they would take the affected lung out of the dead patient and would examine it very carefully with the naked eye. So they had some ideas about the effect of tuberculosis even before the microscope was being used. But with the coming of the microscope, it was possible to examine infinitesimally thin slices of the lungs. There not only could one see the ravages of disease, but, after germs were discovered, these could be stained so as to become visible and the expert could see that the germs were present where the damage was being done. This is the purpose of the pathologist to which Claude Bernard referred in an earlier quotation. Injury to the body—which might be due to a very great number of causes, ranging from the effect of the weather to the effect of germs, of gunshot wounds, or automobile accidents—might change the organs.

After Bernard and his contemporaries made their studies of the human body, the anatomist and the physiologist were

MEN AGAINST MADNESS

becoming more and more able to understand just how the body functions.

Even today very important investigations are being made, but they are very delicate ones. They have to do with tiny changes in the amount of acidity in the blood, and changes in small-celled structures, particularly in the brain, and not everything is yet understood about the microscopic and clinical activities of the body. But the great strides have been taken. The early anatomist knew what a healthy bone looked like when he picked it up and looked at it with the naked eye, and when he looked at small amounts of the bone under a microscope. His ally, the pathologist, began to know what had happened to the bone when disease set in. He saw little holes caused, perhaps, by germs; changes in the structure due to a fracture; and he learned how healing set in. And all these scientists contributed to our knowledge of the cause, the appearance, and the treatment of paresis.

A study of the development of knowledge about paresis gives us some idea of how research is benefiting mentally unsound patients. Our understanding of that disease, because we can see the damage done by the germ, not only under the microscope, but also when we look at the brain of the recently dead person as a whole, has made it possible for us to gain more information about it than about other mental diseases.

In 1857, Esmarch and Jessen reported cases of paresis which were known to have had syphilis, and they attributed the paresis to syphilis. This disease was very likely one of the gifts that Columbus' sailors brought back from the new world to present to the citizens of Spain who had sponsored his voyages. The very best evidence indicates that the disease was non-existent in Europe until that time. It spread rapidly through Europe in the sixteenth century and its ravages were well known. There seems to be no question that physicians

THE ORGANIC APPROACH

were able to distinguish syphilis as a disease distinctly separate from many others, although undoubtedly they knew little about how far-reaching the consequences of a syphilitic infection were.

Due to the number of wars during which soldiers of one country would visit another, syphilis quickly lost its identity as an importation from the New World, and, because of the horrible results of an infection of this sort, no nation was willing to claim it as its own. The English called the disease the French disease; other nations called it the Italian, and, in turn, some nations called it the English. This "buck-passing" serves to show how thoroughly aware all the countries were of the serious effects of this disorder. By the time the modern physicians had begun their work, men like Pinel, Broca, and Hughlings Jackson, and others, there was a thorough understanding of the fact that there was such a disorder as syphilis, that it was transmitted by sexual intercourse, and that it caused horrible eruptions and heart disease. The fact that it affected the nervous system, naturally was not realized because all nervous disorders and mental disorders were so much in the shadow of the unknown that those changes in the nervous system which were due to syphilis could not be distinguished.

Probably thousands and thousands of paretics and those affected with syphilis of the nervous system of other kinds, were merely called dementes by Pinel, by Esquirol and others. But Esquirol, the student of Pinel, and the man who had so many new asylums built, and who attempted to promulgate Pinel's teachings throughout France, recognized that in certain cases of insanity there is a progressive paralysis, and this undoubtedly was the first recognition that paresis is a separate disease. At the same time that Hughlings Jackson, Broca and their confrères were making their studies of diseases of the brain to

MEN AGAINST MADNESS

show how they affected a patient's ability to walk around and to speak, other researchers were paying attention to similar phenomena in the insane.

On several occasions, even before the report of Esmarch and Jessen, a type of paralysis accompanying what they then called dementia was shown to have its basis in destruction of the brain itself. This destruction was widespread and those coverings of the brain which we discussed earlier in this book, the meninges, i. e., the dura mater, and the pia mater, were observed to be defective. Later on, students found that the blood vessels of the brain were eaten away by some cause and that this general paralysis of the insane was a typical disease causing the same type of destruction in all brains that it affected. It presented unique symptoms, and the behavior of the patient was different from that of patients with other forms of dementia.

But little was as yet known about the means of isolating a disorder; so little, for instance, was known about psychology that the delusions of grandeur which our patient showed, his idea that he possessed millions of dollars, and the speech defect which he had, were not noticed to be different from symptoms due to other causes. But again and again some observer would add a little critical finding which would separate paresis from other dementias.

To understand a disease, at least to understand that it is different from other diseases, one must first of all know whether there is a unique cause, one which differs from the causes of other diseases, whether they be mental or purely physical. If the cause is obvious, then one should certainly know whether the symptoms are different. Early in the study of paresis there was an uncritical attitude, one which was due to the fact that psychologists were still in the philosophical stage of their learning, and which made it impossible to segregate

THE ORGANIC APPROACH

this disorder from others. Nevertheless, as time went on those who had the duty of treating the insane recognized that there was a difference. They noticed that the disease occurred in individuals in the late prime of life, and, after Esmarch and Jessen made their suggestions, the number of cases in which a chancre—known to occur in one of the early stages of syphilis—had been observed, were sufficiently frequent so that many excellent physicians suspected that syphilis was being the cause of mental disorder. The chronic alcoholic occasionally has all the symptoms which we have observed in our case described here, and this fact confused the issue.

But Richard Krafft-Ebing, the famous medico-legal psychiatrist of Vienna, made a critical experiment. It was already known in his day that one attack of syphilis granted immunity, for there were no cases on record where a man had had a chancre and other signs of syphilis and been treated by the various means available at that time, and who had again developed the disease. So Krafft-Ebing tried to transmit syphilis to a paretic on the assumption that if paresis were due to syphilis the paretic would not develop syphilis. He knew that if a person had contact with a syphilitic sore he would develop, on the part of his body that had had that contact, a similar syphilitic sore, this fact showing that the cause of the syphilis was passed from one person to another by the contact.

Krafft-Ebing then took some of the matter from syphilitic sores and inoculated it into some patients who had general paralysis of the insane. None of his patients developed the signs of syphilis. This was a crucial demonstration and practically proved that general paralysis of the insane, or paresis, was due to syphilis.

Here was used the same type of reasoning which had been followed in the vaccination experiments of Jenner, who im-

MEN AGAINST MADNESS

munized people by using cowpox. Such findings were fairly conclusive, but it required more scientific work absolutely to prove that general paralysis was due to syphilis. Further studies were sufficient to demonstrate that Esmarch and Jessen had been right.

An innkeeper's son, Fritz Schaudinn, discovered that there was a germ causing syphilis. Looking through a microscope, especially illuminated so that an even smaller germ than usual could be seen, he found a little corkscrew-like wiggler. This characteristically was found in all the sores of syphilis, so by the reasoning applied over and over before to connect a definite germ with a specific disease, to this germ was ascribed syphilis. Up to then millions of cases of syphilis had come under observation, and this same germ was found in practically all cases where a search had been made, which proves not only that we are right in presuming that that germ was the cause of the disease, but that the presence of the germ makes the diagnosis for it.

Sometimes, however, it is not possible to isolate the germ. August von Wassermann discovered a blood test which, although it is not absolutely accurate, makes it possible to find those individuals who have had syphilis, no matter how long previously they have had it. It is possible to make the diagnosis that the patients have had the infection, even if the body has overcome this infection to such an extent that there are no longer outward signs of the disease.

Since this blood test was found to be positive in almost all individuals who gave a history of having had a chancre, and whose symptoms were typical of syphilis, this was considered a specific test for syphilis. Naturally, as soon as physicians had such accurate knowledge of diagnosis of the disease, it was not long before they were able very definitely to say that those who had a positive Wassermann test were syphilitic. If the

THE ORGANIC APPROACH

patient had the signs of general paralysis, the fixed pupils, the changes in the way that the leg kicked when the knee is tapped, and other similar symptoms, it was possible to say that paresis almost invariably was due to syphilis.

The blood test was not always found positive in cases with histories of syphilis of the nervous system, including general paralysis, but Quincke discovered that there is a place in the spine where a needle can be inserted to drain off a little of the fluid under the meninges. This can be done with a minimum of pain and no danger to the patient, except under extraordinary circumstances. Using the Wassermann test on this fluid, the agreement between a history of syphilis, a positive test, and the symptoms of paresis, became even higher so researchers were again even more convinced that paresis was due to the germ discovered by Schaudinn. Finally the matter was cinched. Out of seventy patients suffering from paresis, fourteen brains were found, upon post mortem, to show the organism of syphilis. This work was done by a Japanese investigator at the Rockefeller Institute, Hideyo Noguchi. And after this discovery, the dictum was made "No syphilis, no paresis."

But what good does it do us to know that the brain is damaged in this disease, that the organism of syphilis can make inroads into the nervous system, producing certain special symptoms, such as delusions of grandeur, confusion, and peculiar behavior, if we can't do anything about it?

But we can, and the answer is found in the work of modern psychiatrists.

Many observers, including our old friend Bouillaud, noticed that certain mental diseases clear up after a serious fever. It was known, too, early in the history of syphilis that mercury aids in the treatment of that disease, so often a mercurial ointment was rubbed into the scalps of some of these people

MEN AGAINST MADNESS

who were suffering from insanity, in an attempt to cure them.

The idea of this treatment, of course, in most cases was not only to produce cures with mercury, but also to produce an infection, the concept being that, if the scalp were infected, brain fever would be produced, and the disease would be cleared up.

Paul Ehrlich, a rather sloppy chemist, had made innumerable experiments with analine dyes. Finally he made a six hundred and sixth trial and produced a substance which we now call arsphenamine. An injection of this substance into a syphilitic patient immediately produced a change in the symptoms and often produced cures. Numbers of these people who might later on have developed insanity did not, although there is no way of knowing what is the proportion of cases of paresis prevented by this method. But this was the first stage of curing this mental disorder.

In 1887, Julius Wagner-Jauregg, the chief of the Psychiatric Clinic at the University of Vienna, suggested that an attack of fever might cure a disease and he advocated giving these paretics some other disease to produce a fever, in the hope of curing the paresis. He mentioned malaria as one of the diseases suitable for this purpose because it was not too dangerous for the patient, was not particularly contagious, and could be cured easily by the use of quinine.

When tuberculin, a substance which was made up of products of the tubercule bacillus, was brought into the market, Wagner-Jauregg injected his patients with tuberculin. He found that many of his paretic cases got a great deal better and some were able to go back to work.

This is not entirely surprising, for there have been cases which were treated with either mercury or arsphenamine, or

Plate XXXVIII

JULIUS WAGNER VON JAUREGG



THE ORGANIC APPROACH

very occasionally which had not been treated at all, and yet spontaneously got well.

But, with the tuberculin treatment, Wagner-Jauregg found that there were a few more getting well than one would have predicted in the case of the old-fashioned forms of treatment. It was as far back as 1909 when he first treated cases with tuberculin, but he reported that in 1921 some of these patients were still working at their occupations and doing excellently.

But he was not satisfied. He continued to observe that whenever there was concurrently an infection such as erysipelas, an abscess, or pneumonia, the paretic cases had a tendency to get well. As a result of this observation, Julius Wagner Ritter von Jauregg, as he was then known, decided in 1917 that he should try actually to infect some of his patients with the disease malaria to induce a fever reaction to see whether by this means a cure might not be brought about, an idea which had attracted him even as far back as 1887.

He had in his clinic a soldier who was ill with malaria. He drew some of the soldier's blood and inoculated nine of the paretic cases in his clinic. He found that in six of the nine cases the result was distinctly favorable, and three of them, at the time Jauregg made his last report, were still actively engaged in business. This seems like a very simple discovery, but really it is of momentous importance.

As soon as Wagner-Jauregg reported the advantage of giving this rather mild disease, malaria, to his paretics who were suffering from such a vicious form of insanity, and when he emphasized how it produced favorable results, the world opened its eyes to his studies. I have tried to give the reader some idea of the logical processes that Wagner-Jauregg passed through, and of the amount of knowledge that medicine had

MEN AGAINST MADNESS

to acquire about syphilis and paresis, before he could institute such treatment.

But from then on the treatment of paresis blossomed. It spread throughout the world. It was worthwhile, for instance, in prisons to find out what individuals were suffering from paresis because, if they were treated for this disease, they might get well enough to go out to become law-abiding citizens, and not to prey upon the population. During the last year I examined a man who was brought into court for fraud. He had set up a highly imaginative sort of business and had taken money for capital stock. Naturally the layman who bought the stock could not recognize from the man's flowing speech and his rather peculiar ideas that he was suffering from a form of insanity. Nevertheless he was. His was a very early stage of paresis. If it had not been for the stupidity of those who invested with him, he probably would not have gotten into trouble, but all the complainants were so anxious to make money as fast as possible that they swallowed his fantastic scheme, which was way beyond reality, and entrusted their money to him—then he "cooked his own goose."

The man was arraigned in a criminal court, was referred to our clinic, and in two minutes we had ascertained the fact that he was suffering from paresis. He talked about having invitations to go out with the President's daughter, a woman who undoubtedly had never heard of his existence, and who, if she had, would not be interested in him. He told about being Admiral in the United States Navy, an utterly preposterous statement, for he had spent the preceding fifteen years in Detroit, and had had no connection with the Navy. He had other bizarre ideas of the same sort. Because he had committed a criminal offense, he was sent to the institution for the criminal insane in the State of Michigan. There he was given malaria treatment and, in six months, he had been returned to

THE ORGANIC APPROACH

the community comparatively well. It did not take him long, after his release from the hospital, to get himself a job, and now, after almost two years, he is adjusting nicely.

Ever since discharged, he has been in no more trouble. He has a little tendency to talk too much perhaps, but I know of many cases who have not had paresis who indulge in this weakness. As I said, he is comparatively well. Is it not encouraging for us to find that here, at least, is a mental disease of which we recognize the symptoms as being distinctly characteristic, and for which we have a definite treatment that brings about improvement?

At Eloise Hospital, in Michigan, a strain of tertian malaria was brought into the institution in 1925. From that date to this the same malarial strain has been passed from patient to patient suffering from paresis and today is just as strong and helpful as it was then. The number of deaths from malaria is very small, and in a demonstration in which I took part where we presented a number of cases treated by this method, we were able to show men who are actively engaged in their occupations, some of them having as good jobs as sales managers of high-class organizations, professional men, factory workers. All of them had had this treatment as far back as 1925 and 1926, and today they not only are earning their living but are keeping out of trouble and appear to the layman to be normal.

Their blood tests are negative, their pupils react better than they did when the patients were given the treatment, but in some cases not perfectly. And even those cases that are not actually cured by the malaria are improved physically and mentally. They can do small jobs around the hospital, can be returned to their families, and are able to help around home and to be comparatively harmless. They live many more years than such cases did before.

MEN AGAINST MADNESS

Nobody knows just what this fever does to the nervous system. Certainly it makes it work better. It brings it back almost to normal in many cases.

With the idea in mind that it is the fever produced by the malaria that brings results, rather than the disease itself—since other fevers, more dangerous perhaps, work as well as it does—we may presume that if we could produce the heat without the infection and with less likelihood of death, that would be a great step forward. Modern physics supplies us with a method, for it is possible to raise the heat of the body artificially.

There are several ways of doing this. One of them is by use of the simple Turkish-bath cabinet or a modification of it. The patient goes into a chamber with his head projecting out, his neck wrapped around with towels so that the heat from the chamber can not reach his head, and he is baked. His body temperature rises as high as 104 or 105 degrees. After he has had a number of hours of this treatment, occasionally he recovers as well as if he had had malarial treatment. If his heart, lungs and the rest of his body are sound enough so that he can stand this heat, he gets well without ever having to have a superimposed disease.

The radio has been of assistance in inspiring ideas as to carrying out fever treatment. It has been found that by building a device very much like a radio sending set and hooking up the body so that it will act as an antenna, the heat of the body can be raised. In this particular case, it is not necessary for the patient to be subjected to the heat produced by the electric-light bulbs in the Turkish-Bath cabinets, which sometimes burn the patient. The temperature can be raised very much as it would be by nature.

We know from the work of Claude Bernard and Hughlings Jackson that there is probably a place in the brain which de-

THE ORGANIC APPROACH

termines body temperature. There is no safe way of stimulating this center in the brain so that the patient will have a fever "on his own initiative," but, by means of the radio-therm, the physician can raise the temperature of the patient's body just as though he did have a protective fever.

We have then, in the case of paresis, an indication of what is to come in all of psychiatry. One cannot fail to be impressed by the fact that one hundred years ago we did not even know that there was such a disease, yet today it is "curable." Seventy-five years ago, we did not know that the disease had anything to do with syphilis. Fifty years ago we did not know what the cause was, whether it was a germ or not. Twenty-five years ago we knew the causes, but we did not know what the treatment was, and now in almost fifty percent of the cases we can diagnose it accurately in a few moments, and give treatment in a few weeks which will restore the mind to a comparatively normal condition.

We can certainly presume that many of the mental diseases which are now considered incurable or only partially curable today, are in the same situation that paresis was in one hundred years ago. Those whom we hear condemning psychiatry for not curing more of the insane (and there are undoubtedly many more cured than formerly) forget that, after all, medicine does not cure cancer—it is cut out in many cases, or burned out by radium or X-Ray—and science cannot yet do anything to the body so that the cells that have gone wild (the cancer cells) stop their wild procedure. Yet in paresis that has been done—we have made the brain behave as it should, even though it has been badly damaged.

"QUACK" NUMBER TWO—MESMER

A POST CHAISE drove up before the entrance of No. 261 Landstrasse, Vienna, and a young man descended. The door was opened by a servant, and the guest was admitted.

"Will you tell Dr. Mesmer that Wolfgang Mozart is downstairs?" he said.

The servant, to whom the name was already familiar, nodded and took the message to Dr. Mesmer.

The date was March 17, 1781. Wolfgang Mozart had just arrived in Vienna, for a second visit. He was anxious to see Dr. Mesmer, an intimate friend of his family, because he felt deeply indebted to him. A few years before, when Mozart had visited Vienna, and, at the request of the Emperor, had prepared to present an opera, the jealousy of the director of the State Opera House prevented him from doing so. Mesmer, a liberal and wealthy man, had erected a little theatre on the spacious grounds of his Landstrasse home, and there Mozart had presented his first Viennese opera, and had immeasurably strengthened himself in the minds of the cognoscenti as being a real artist.

Franz Anton Mesmer was a German who had come to Vienna, much as had Gall, in order that he might study medicine, for Vienna was the medical center of the world at that time. He came from a rather impoverished home, his parents

"QUACK" NUMBER TWO—MESMER

being people of no great significance in a small community near Lake Constance. It was here that the original Zeppelin hangars were built a century later. Mesmer was a dilettante; of that there is no question.

It took him quite a while to settle down sufficiently so that he could engage himself with one occupation. He started out to be a theologian, but there is no record that he ever graduated from the theological seminary where he went. He did take a Doctor of Philosophy degree, and he studied law. After doing all this, he finally acquired for himself a medical degree, but he never settled down to practice; in fact, there was no need for him to do so.

He was a man of decided attractiveness, being tall, serious, and having a way with women. And it was no time after he had reached Vienna that he secured for himself a wife well provided with the substance of life. She was the wealthy widow of Councilor Von Bosch, and judging from what Mesmer wrote in his letters from time to time, he married her for her money. He calls her stupid and unattractive, and he hesitated but little to secure for himself romantic outlets other than those which a devoted family man would find interesting. He loved to surround himself with young girls, and he was as attractive to them as they were to him.

To go back now to our story—when Mozart was greeted by his host he remarked how well Dr. Mesmer looked. Mesmer patted him on the back, said a few encouraging words, and remarked in turn that he was glad Wolfgang had come to Vienna to stay.

They went to the back of the house and entered the spacious gardens. There were little fountains, statues, shrubbery, and the whole place was very much like a miniature royal palace. Since Mesmer was doing very little at that time in the way of active practice, it is to be assumed as undoubtedly the

MEN AGAINST MADNESS

case that Von Bosch, through his life of commerce, had amassed a certain amount of wealth which Mesmer was now enjoying.

Mesmer himself was known as a musician. He played the 'cello and the pianoforte. He had acquired for himself that terrible and, at the same time, beautiful instrument known as musical glasses, which consisted of a row of tumblers tuned by filling them with water up to different levels so that, when struck, each one produced a distinctive note. They must be "tuned," and with even a little evaporation the tones are apt to change, producing a bad discord. Performers on this instrument are mercifully rare nowadays.

While the two men were talking, a buxom young woman came up to them and spoke to Mozart. For a moment he did not recognize her.

"Why, it's Fraulein Franzl!" he said, and in a somewhat breathless manner added, "My, how stout and healthy you have become. When I was here five years ago you were a wreck, and we had very little hope of your surviving."

The lady simpered, blushed, and looked with rather affectionate eyes at Mesmer.

"There was really little hope for me," she answered, "but my cousin, the doctor here, treated me with his magnets. I am sure that you have heard of them. I am married now, and I have three children."

Some time before 1770 Mesmer, in his perambulating way, had come in contact with a Father Maximilian Hell (Hehl). Father Hell was rather a worldly prelate, and he had acquired a secret of making magnets which had a curative value.

Magnetism was by no means new—the lodestone had been known to the ancients—and magnetic powers were a source of great interest to the contemporaries of Mesmer. Only a

"QUACK" NUMBER TWO—MESMER

few years before, the discovery had been made that iron could be actuated into a magnet by stroking.

Mesmer had always had some tendencies toward mysticism, and, with his theological training, it was not surprising that he should make friends with Father Hell, particularly since we are led to believe that Mesmer's turn of mind was rather inquisitive. He was always asking questions, seeking information. However, he was unfortunately more of a born dilettante and conversationalist than a true investigative scientist. It is, perhaps, here that we find Mesmer's greatest weakness, for had he been more scientific the later developments in his life would probably have made him one of the greatest contributors to psychiatry, rather than result, as they did, in his being branded as a charlatan.

His mystical turn of mind made him swallow Father Hell's theory that there was such a thing as magnetism which had curative power. He had watched Father Hell treat some rather prominent people, who had not been successfully handled by the regular medical practitioners, and when Franzl Oesterlin, who was suffering from hysteria, had not been successfully treated by the local big-wigs of the medical profession, Mesmer turned to Father Hell and his magnets. He purchased a set of magnets, two of which were like splints, to be fastened to the girl's thighs, and there was one heart-shaped magnet which he placed on her chest.

Of course, Mesmer had no way of knowing that suggestion would play any part in his treatment. But he was struck by the fact that as soon as these magnets came in contact with the girl, her whole behavior changed.

Previous to her treatment she suffered from convulsions, attacks of vomiting, intestinal pains, hallucinations, temporary blindness, cataleptic trance, swooning, and attacks of

MEN AGAINST MADNESS

paralysis. She had pain in her teeth and all over her body, as so many hysterical women have, and the nature of the disease was certainly recognized by Mesmer. Some of his critics are prone to point out that he did not recognize that hysteria especially was treated by his magnets, that he had the delusion perhaps that all diseases could be magnetically treated. But we are struck by the fact that the first recorded case he treated was one of hysteria.

Now hysteria had been known to the ancients, and sexual connections between hysteria and the genital organs is demonstrated by its name, for it comes from the Greek word meaning womb. Until the more recent Freudian era these sexual facts were not clear-cut.

In Mesmer's case this hysterical girl did get well, and later on in his life, since an accusation of immorality was made, one may say that perhaps by intuition, if not from scientific knowledge, Mesmer recognized that there was a sexual connection between the disease hysteria and its causation.

All of us know that we can pick up a magnet and feel nothing, one gets no shock, no pains or sensations. Whatever physical characteristics there are, they are made known to us only through the phenomena that we can observe.

So, when Mesmer applied to Franzl this set of magnets which he had prepared, and she had excruciating symptoms, obviously these symptoms were produced by suggestion, for the magnetism itself could not have hurt her. But she screamed and complained of a hot piercing pain running along her legs through her feet, and, characteristic of all these mental disorders which have little physical basis, there was symmetry in the symptoms. In other words, the feeling occurred in both sides, and united in the midline, affecting both breasts, and then rose to the top of the hair, uniting in the parting in the midline. No germ-caused disorder could do this.

"QUACK" NUMBER TWO—MESMER

The patient complained of a burning sensation, like that caused by a burning coal, in all her joints, and as the paralyzed side of her body began to perspire freely she soon recovered.

To us, in our more enlightened era, it is obvious that this girl was sick because of some mental condition. Some of her thoughts were not functioning right. Deep down in her heart, let us say, she had some causative factor which was preventing her from facing her problem, so that she developed this disease, which could be cured only by psychological treatment. The magnets were an intermediary for the psychological treatment.

Since Father Hell was not a medical man, and Mesmer was, it is natural to expect that Mesmer's reputation for producing cures by means of his magnet would be accepted by the community much more quickly than Father Hell's, and this was the case.

Mesmer began to be in demand—he was wanted in Germany. He was invited to all of the castles nearby—he was the current sensation.

It was to be expected, of course, that when a man becomes as popular as Mesmer became, other medical men would be jealous, especially since there seemed to be little logical grounds for his cures. He was unorthodox, and his explanations of why these magnets worked were not at all reasonable. He failed to take the medical men into his confidence, giving them perhaps the idea that he had some mysterious force that he would not divulge, so that all in all the man who had been so popular because he fed local medical men well in his house and entertained them, quickly began to lose his popularity.

When he asked that a committee of medical men be appointed to investigate this new discovery of his, none of the professors appeared, and the same board of examiners who sent Gall away from Vienna, began to take an active interest

MEN AGAINST MADNESS

in him. In the meanwhile, Mesmer had made some changes in his doctrine. He did not believe entirely in his magnet. At the time that he was operating with magnets, he had the idea that there was an electrical force which had a healing value which passed from the magnet into the sick individual.

Eventually, he came in contact with a man by the name of Johann Joseph Gassner. Gassner, too, was a Churchman but his procedure was different from that of Father Hell. He made mysterious passes and produced the same sort of cures. One can well imagine that Mesmer's belief in himself and in magnetic power to cure was shaken by finding that the same results could be obtained merely by passing hands over an individual, and it was here perhaps that he made a mistake.

When he found out that he could produce the same results by merely bringing his body in juxtaposition with that of the patient perhaps without any actual physical contact, he should have admitted that magnetism was not the essential thing. Instead of that, he tried to combine magnetism with the new procedure. He rationalized this situation by saying that there was such a thing as "animal" magnetism; that the same subtle rays or forces that came from the metal magnet also came from the human body and in that way affected the patient to bring about a cure.

This was even more bizarre than his original idea, yet, since he continued to have splendid results in his treatment and to produce more adherents, his new discovery or new interpretation merely laid him open to more criticism on the part of jealous confrères. Since he was wealthy, he could treat a great number of patients without requiring any fee, but he also had among his patients the wealthy and those who could afford to pay. Just as today many medical men feel that an effort made by the state to produce better medical care is an infringement on the right of the medical men to practice, so

"QUACK" NUMBER TWO—MESMER

in those days the medical men felt that Mesmer's theory, his attempt to expand practice with new type of treatment, was beyond the pale.

With an increase in his fame, the inevitable happened. Few of us see our humble occupations raised to the point where we are the most important person in our profession in any great city. This happened to Mesmer. From an obscure practitioner who was well married and had a little coterie and a number of diverse interests of no great importance, Mesmer became an important therapist. His house was crowded as if it were a clinic. As a result, he soon came to the conclusion that he at last had made the one great discovery which separated sickness from health, and that if his principles of treatment were widely invoked there would be no more disease. It was hard for him with these ideas to understand why other practitioners would not "go along" with him. He went completely berserk. He felt that he could magnetize anybody or anything. He would magnetize beds and put women to sleep in them. They had a wonderful sensation and much better rest. He magnetized the ponds and gouty old men, particularly those who were not perhaps too diseased or decrepit, came out of their baths in these ponds completely rejuvenated and practically prancing in the streets.

At about this time Mesmer discovered that there must be an interest developed between the physician and the patient. He called this a *rappor*t. This term is used today by the psychiatrist in describing the fact that he has the interest and co-operation of his patient, and perhaps that he actually has the love of the one who is desirous of having him cure him or her.

Mesmer was not in the strictest sense a scientist for he published only one or two very small volumes. His original report had no scientific standing; it was merely a list of premises upon which he thought that a serious treatment was based.

MEN AGAINST MADNESS

It was probably no more valid than his doctor's dissertation, which was based upon some of Paracelsus' old ideas, namely, that there was a connection between disease and health in the arrangement of the stars.

But Mesmer was by this time a fanatic. All the arguments in the world probably would not have changed his attitude toward his "science."

While he very definitely was on the right track, his aggressiveness, his lack of understanding of basic principles involved—and he could not really understand them, because he was in advance of his age—brought him quickly into disrepute. But adverse pressure was beginning to be put on him. Contemporaneous physicians were none too pleased that their patients were going to him and being cured, and did they do their best to make trouble for him! He invited his fellow physicians to visit the hospital that he had opened, not only because he wanted to get them interested, but because he thought that he was running it on truly scientific principles. It is true that he, himself, was skeptical of his own theories but there was no doubt in his mind that he was operating on sound principles, for, after all, he was bringing about cures.

But in response to his invitation, none came. He was surprised at this for he felt that his earlier treatment of the medical profession and the fact that he was doing good should have been enough to overcome what skepticism it might have about the scientific value of his work. Not only was he beginning to be embarrassed professionally, but, as so often happens, the little coterie who were only too willing to eat his food began to have previous engagements, and he knew soon that he had more false friends than true ones. An underground campaign was started against his treatments and anonymous enemies would write letters to the papers decrying his meth-

"QUACK" NUMBER TWO—MESMER

ods, casting ridicule upon them. But his enemies were at a disadvantage for, after all, he was a duly licensed physician; and not only that, but he did have a reputation as a highly educated person with considerable standing in the community.

It was not long before his enemies had the opportunity which they had desired. A young girl named Maria Theresa Paradies was brought to him for treatment. At an early age this girl had become blind. The ophthalmologists in Vienna had diagnosed the case as optic atrophy (destruction of the optic nerve) and had said that nothing could be done for her. As in the case of many blind people, Maria had learned to amuse herself by playing the piano. She had a remarkable ear, a gift which was enhanced by the fact that she had no visual distractions, and she was soon invited to play before the Empress. She was granted a pension of two hundred gold ducats and the Empress had her educated. Not only was she a brilliant, gifted pianist but she also composed, although the compositions were never published.

As I have indicated in the case of Fraulein Oesterlin, the diagnosis of hysteria is an old one. The ancients realized that there were certain diseases which were brought about by emotional strain. Characteristic of these diseases were paralysis, twitching of the hands and face, loss of sensation, convulsions, fainting spells, and other symptoms, which very closely resembled those of physical disease. But the skilled neurologist, even in the time of Mesmer, knew that these symptoms were characteristic of a disorder which many times cleared itself up when an emotional situation was relieved. So, after examining her, Mesmer concluded that Maria's blindness was not due to atrophy of the optic nerve, due to injury or real disease, but that something had gone wrong in the machinery in Maria's

brain which permitted her to interpret what she saw. In other words, her blindness was of mental origin, rather than due to loss of function of the nerves themselves.

He began to treat her. He took her into his own home and did not charge her for these treatments at all.

Mesmer's report of the case is different from that of his rivals. They claimed that the girl was not improved, that it was purely imagination that she thought that she could see. But Mesmer claimed that her eyesight was almost completely restored. He reports how she first began to distinguish the contours of certain objects placed before her eyes. It was necessary, because of the long time that she had gone without vision, to darken the room because of the sensitivity to light that she showed. She had to be bandaged a good deal of the time, and if light was suddenly admitted to her eyes, she would fall to the floor. All her conduct was that of a blind person restored to sight, as we see them today after cataract operations or operations giving vision to those who have been blind from early childhood.

Maria had trouble in recognizing things that she had heard described or had felt, and after looking at Mesmer and also looking at her dog, she said that she much preferred the appearance of the latter. She continued to show a number of hysterical traits. When she saw the color black, she became quite melancholy, saying that it reminded her of her former blindness, and on one occasion she became so depressed that she had a sobbing spell which greatly upset people about her. She soon began to complain that she was less happy after she had recovered her vision than she had been before.

This was perfectly natural. She formerly got a great deal of attention. She had been that "poor blind girl" but now she was no different from anybody else. She had not had the use of her eyes long enough to realize that she would be happier

"QUACK" NUMBER TWO—MESMER

with them, and the hysterical tendencies that were part of her were enough to make her likely to break down and prefer attention-getting mechanisms such as her blindness to a normal life. Because she was so depressed, and because she no longer had the singularity of concentration which is so often found in those people who have lost the sense of sight or hearing, her piano-playing began to deteriorate.

Mesmer was earnest and scientific at this stage of the development of his career. His report of the Paradies case closely resembles the scientific report made by any recognized physician of his time. He told only what he did and what happened, but it was made the basis of a tremendous attack. The whole of the science of medicine in Vienna was perhaps being shaken. Here was a girl who had been blind. Her vision had apparently been somewhat restored, in spite of the statements made by the leaders of the medical confraternity. If this treatment were to go on any further, all the patients in the city would go to Mesmer and the doctors would starve. The most influential physicians in Vienna began both an indirect and a frontal attack. The insulting articles which appeared in the various papers had done nothing to harm Mesmer. In fact, they served to attract the public to the underdog. But it was possible for certain doctors to put pressure on the powers that were.

Mesmer had in mind the plan of taking Maria to the Empress and showing her how the little girl's sight had been restored, and he and Maria were quite pleased over the possibility of this adventure. Before Mesmer could carry out this plan the parents of the girl were approached and the word was lightly dropped that, if the girl's sight were restored, there would be no need further for the Empress to be giving her two hundred ducats a year to the family.

Human nature was no different then from what it is now,

MEN AGAINST MADNESS

and experience with relief procedure during the recent depression would warn anyone how resistant a family would likely be toward giving up a pension dependent upon their child's blindness. Perhaps there are families who would give it up, perhaps the child's happiness would outweigh the monetary consideration, but this possibility was not presented to the Paradies family, and they immediately demanded that the girl be restored to them.

She had been very happy. Living in Mesmer's house had been a pleasure. It was a very happy place and Mesmer himself took quite an interest in Maria. She continued to refuse to go home, and her mother was furious. She violently scolded the girl for preferring to stay with a stranger rather than with her own family, and her treatment of this neurotic girl was such that Maria soon fell into convulsions and the blindness again came over her. The mother had done everything in her power to break down the attachment, and the influence which Mesmer had used on the girl to restore, even feebly, her sight. But this was enough to provide the medical faculty with big guns and real ammunition. Cardinal Migazzi, the Empress, and the Court, and even the Committee to "Sustain Morality" had been mobilized in order to drive Mesmer from Vienna.

The president of the Medical Council was commanded by the Empress to put a stop to this humbug and almost immediately Mesmer left Vienna.

From Vienna he went to Switzerland where for a time he made his residence. From Switzerland he went to Bavaria, and he wandered back and forth between these countries for a few months, trying to make up his mind where to go.

Finally, in January, 1778, he set forth on a journey to Paris. He had come to the conclusion that people there were more enlightened and would probably understand his teachings. There was some justification for this belief. The Parisians

"QUACK" NUMBER TWO—MESMER

at that time were undergoing a sort of a preliminary revolution, and the thought of France was possibly more enlightened than that of any other part of Europe.

Voltaire and his disciples were rabid against the conservative thought of that time. Religion and its bounds were being rejected and royalty was slowly being moved forward on the skids which soon would precipitate it into oblivion. Science in France was very much encouraged. Lavoisier and others were making rapid advances in chemistry and physics.

As we have seen from Gall's experience, it was not at all unusual for a physician in those days to make the trek from Austria to France, and many physicians who did take this trip were well received with open arms by the more forward-thinking French people, so that we certainly may consider Mesmer's decision to have been a wise one.

Mesmer looked forward to his arrival in Paris with a great deal of hope. Not only was Paris a gay and happy town, but the known liberality of thought made him feel that Paris would be receptive to his theories, but he was soon to be disillusioned. Arriving in Paris with the best of credentials from his noble patients in Austria, he found every drawing room open, and immediately was able to make contacts with innumerable influential people.

Among them was the president of the academy of the sciences, a rather smart politician, but not a great scientist. Through him Mesmer hoped to secure entree into the learned circle. He was still convinced that he had a proper scientific form of medical treatment and would never face the issue that he was a quack or that his means of treatment was other than a new, valuable, and proper one. In this way Mesmer differed from many of the charlatans who were recorded in history. Most of them had no medical connection, but treated only through some vague religious or pseudoscientific theory

MEN AGAINST MADNESS

which, because of their own charming personalities or their eccentric behavior, was convincing to the laymen. In other words, it was suggestive therapy. From time unrecorded, charlatans have suggested that their means of treatment would heal, and patients being responsive and anxious to get well, with Nature's help they did.

This, of course, was true about Mesmer's form of treatment, but he was a medical man and he applied such criteria to his ideas as he had at his command. He knew of no other explanation than the one he presented of the fact that, when he touched these people in certain ways, they recovered. It must be magnetism, he thought, for that was the only analogy that he knew of. So convinced was he that he was right that it discouraged him, almost broke his heart, when one academy of science after another curtly presented its report, saying, "There is nothing to it." The Austrian Academy, as we have recounted, had no use for Mesmer. Probably, even if his theory had been easily understood, if it had been logically along the lines of other medical work, his prestige and popularity would have antagonized his colleagues. But this situation did not exist in Berlin where the Academy, just before he left for Paris, condemned his theory without hesitation. We know today that the theory itself is untenable, that the magnetism of the body cannot be measured, even though there are similar electric currents and the human body does influence fine magnetic and electrical detectors. However, we do not know that any of this magnetism has anything to do with curing people, and we do have a pretty good idea that there are other phenomena involved when we have a situation such as that which confronted Mesmer.

But he was sincere, and on reaching Paris his early and most earnest hope was that here he might secure real scientific recognition.

"QUACK" NUMBER TWO—MESMER

His friend, the president of the Academy of Sciences, did carry out his one promise, namely, that he would try to get the Academy interested, but the members of the Academy had received their instructions. They already were aware of the fact that Austria and Germany had rejected Mesmer, and they wanted no part of him. They immediately voted to have nothing more to do with him.

But during all this plotting and all these politics, Mesmer was by no means silent nor did he hide his light under a bushel. He was becoming very well known and had developed an extremely attractive clientele. In fact, so many of the nobility and influential people were clients of his, or patients perhaps we might call them, that after his next failure to secure recognition at the hands of the Academy of Medicine, he quite high-handedly wrote a letter to the Queen and told her that unless recognition were accorded him, he would be getting out of France.

He had hoped that this threat would be enough to put pressure on the medical people in the same way that they in Austria had put pressure on him, but he was to be disappointed. He learned the lesson of so many reformers, and one which he should have really been alert to by this time, namely, that most friends are fairweather friends—and he was deserted. It is true that he was offered twenty thousand francs if he would stay in France, but he said that, since there were conditions attached to this offer, the chief one of which was that he would have to initiate three physicians into all his secrets, he would prefer not to accept the offer.

Here real charlatanism shows its head. Why, if he were sincere, would he not have initiated physicians, so far as he could? There are only two possible answers. The first is, that he was not fully satisfied as to the strength of his own theory so that he feared that, if he fully initiated any disciples, he

MEN AGAINST MADNESS

would be ridiculed; and the other, that after all he was money-mad, in spite of the fact that many of his more friendly biographers claim that the earning of money was to him only incidental, and that his chief object in life was to promulgate his theory. If anyone else could do the same work, Mesmer's income would be impaired.

Among Mesmer's disciples was a young physician, Charles D'Eslon, who was in the fortunate position of being the private physician of the Count D'Artois. Through his connections with the Count, D'Eslon attempted to get for Mesmer the endorsement of the King's physician but it was not forthcoming. But D'Eslon, himself, was thoroughly sold on Mesmerism. He spoke violently before meetings. He personally tried to get the Academy of Medicine to endorse Mesmer, and at one time he had a dinner for the ten most prominent physicians in France, although only three attended. Because of the fact that D'Eslon was no more successful than this, for some time Mesmer rejected him. Radicals have little tendency to accept the unsuccessful disciple.

In a rage Mesmer left for Spa. While he was there he wrote a second book on his theory, and this perhaps was a little bit more lucid than the previous one. And because of its lucidity it laid him open to a little more criticism. The day of mystical medicine was fast coming to a close. Harvey's discovery of the circulation of the blood; innumerable discoveries in anatomy and in physiology—particularly concerning respiration—and in chemistry and physics were beginning to make distinct and important inroads into the thinking of the medical men. Mysticism no longer had a place, and, unfortunately, the only theory and the only explanation that Mesmer had for his cures was a mystical one.

There were several charlatans plying their trade about Paris, men who had no medical background and made no pre-

"QUACK" NUMBER TWO—MESMER

tense of trying to explain how they produced cures. They had no theories. They made no attempt to integrate themselves with the medical profession, and because of the fact that theirs were mystical and Mesmer's theories were no more easily understood than those of Count Cagliostro and others of his ilk who were out-and-out quacks, Mesmer already was classified with them. The layman does not care whether his physician is licensed, whether he is a legitimately trained practitioner of medicine, whether he has any standing with the medical profession—all he wants is to be cured. If he has an ache or a pain, the man who can make him get rid of it, or at least forget it, is the man for him.

Nevertheless, we should in all fairness note that the faculties of medicine are the guardians of the health of the people. Their conservatism and carefulness, their failure to endorse radical cures until certain specified means of testing them have been carried out, have for generations stood between the dangerous poisoner, the fool, and the patient who is also a fool. Gradually extreme standards have arisen. It is, of course, very difficult now for a man to become a physician without many years of training. If one compares the health of the population as a whole today with that of any preceding generation, he can see the value of this critical attitude.

Nevertheless, men like Gall and Mesmer, and to some extent Freud, have had to battle the conservative element in the medical group. No really new thought, no dynamic concept has easily been admitted by the medical profession.

The chiropractors and osteopaths of today are not highly regarded by the orthodox medical profession. Yet many of the massage techniques of the osteopath have been adopted by the medical profession for the benefit of their patients. Cults do produce "cures." One should not then condemn the physician for failure to recognize cults. He should be encouraged to make

MEN AGAINST MADNESS

the cult live up to the standards of scientific medicine until it falls by its own weight, or its most valuable features can be assimilated into a legitimate careful technique of the healing art.

Regardless of this idea, however, the public picks its physicians by personality rather than scientific training. The most immature and the most stupid of the medical profession in this country may well be the most successful from a financial point of view. If such a man can fool enough gullible people into taking his medicine, and if they feel better, even if it is only the result of a suggestion that they will feel better, his name is made, and so it was with Mesmer. When he left France memorials innumerable were drawn up to condemn the medical profession for not keeping him in that country. Priests made speeches in his behalf, and about a hundred of his disciples got together with the idea in mind of starting an Academy of Mesmerism.

"If," they said, "the conservative medical elements are not willing to admit of Mesmerism being part of real medicine, then Mesmerism shall stand on its own feet, for after all Mesmer has healed, we have seen him heal, and it would be a great loss to France if anything were to be done to harm this new healing art." So the academy was established.

After the organization of this institute, Mesmer felt that now was the time for him to return to France. And when Mesmer returned to Paris, he was really in his heyday. This was when charlatanism and Mesmerism linked arms. No longer was he the earnest scientist who was trying to put over a theory which would benefit mankind. Now he was the thwarted agitator who had met with nothing but disappointment, and who had triumphed over his rivals even though he had not secured recognition from them.

He reopened his clinic and soon developed there an air of

"QUACK" NUMBER TWO—MESMER

mysticism that was never erased. But this air of mysticism probably was more valuable in establishing him than the actual cures which Mesmer brought about. No longer were his clinics devoted particularly to the cure of disease, but they were places where his patients indulged in orgies, rolling about, becoming emotionally drunk, and even, it has been rumored, indulging in some sex play. Mesmer set up a definite atmosphere which would bring about this sort of reaction. Being branded as a charlatan, he used all the tricks of charlatany and used them as only a master could.

His chief stock in trade was an apparatus which he called a *baquet*. This was an oak tub filled with iron filings and broken glass. At the top were innumerable bottles with the necks sticking out toward the patient, and projecting from the *baquet* were iron rods. These iron rods were supposed to spray magnetic rays upon the subject, and the bottles were supposedly filled with magnetic water. As we have noted earlier in his career, Mesmer maintained that he could magnetize any substance so that it would have a therapeutic power. Water, stones, trees, dogs, another man, and these *baquets* were supposedly highly magnetized. Before a patient could come to Mesmer's clinic, it was necessary, sometimes as long as two or three weeks in advance, to make an appointment. He did not confine his practice to the nobility, but tried to keep up the pretense of scientific truthfulness and disinterestedness in money by having a number of poor people come also. Some of the observers of his procedures report that next to Countesses and Dukes could be found street sweepers and prostitutes.

All would gather about the *baquet*, each would take hold of the hand of the next one to him on either side, forming a "magnetic ring." The lights would dim, and nearby a musical instrument played. Mesmer's biographers seemed to disagree

MEN AGAINST MADNESS

with one another about what this musical instrument was. Some say it was a harmonium, others a pianoforte, and Mesmer himself has been accused of playing the accordion during these seances. Of course it is not impossible, for he was a musician, but the man did work under the pretense of being a humanitarian, and accordion-playing scarcely fits in with such a pretense. The seance was accompanied by soft lights and sweet music. The majority of the patients being women, there were enough neurotic, high-strung and spoiled damsels in the group so that they would be easily affected by this romantic and emotional atmosphere.

Mesmer and his assistants, who were good-looking young fellows, passed among the group and Mesmer would touch an occasional individual with his wand, a beautifully wrought piece of iron, presumably giving refractory individuals a little extra dose of magnetism, one procedure which would remove any question as to whether he was any longer a scientist. He had become entirely the magician.

Soon one or more of the girls would start to sing, possibly to squeal, to cry out, and eventually a number of them would roll on the floor in convulsions. There was a cell padded in silk, where any extremely rambunctious patient could be taken so that she would not hurt herself, and he allowed his patients to sleep, to have convulsions, or to behave in any bizarre fashion that might come to their minds during this semi-stupor, for as long a time as they desired. Soon they would come out of their spasms and apparently the feeling was so pleasant that time and time again patients, young women in particular, asked to be given a second treatment, whether they needed it or not.

Regardless of the pleasure of the actual treatment, it was as necessary for the elite to be mesmerized in those days as it is now for an old lady to have an operation to talk about at a

Plate XXIX

A MESMERIC SEANCE
Observe the swooning lady of fashion in the lower right, the gaudy aristocrat with his foot on the table, and Mesmer in the far left holding a wand in his hand; behind him are two musicians accompanying the festivities.



"QUACK" NUMBER TWO—MESMER

tea party. It was stylish, and that was all that there was to it. We know little about any actual cures that were accomplished at that time. Certainly the majority of people in Paris, or at least a great number of them, were profiting by Mesmer's presence there. They were feeling better, their ills were certainly in the background, if not cured, and he became so popular that not only did he run his own clinic but he helped D'Eslon, with whom he had become reconciled, to open a clinic of his own. Poor D'Eslon, who, in his fight with the medical profession, had lost all of his standing, was certainly entitled to this much.

But still the patients continued to come to Mesmer. He could not satisfy the demand. Finally he Mesmerized a tree, and all the poor people in Paris could come to it for treatment. But even such an eccentric and non-scientific type of performance did not serve to curtail his popularity.

He coined money hand over fist and, if he had been willing to let well enough alone, he might have come out of this period of his life at least with a comfortable income and a certain amount of reputation as a quack. But this did not suit Mesmer.

As he had when he left Paris, he tried to bludgeon the medical profession into accepting him. He knew that his popularity even now was increased over that which demanded his return to Paris and he felt that, if he could have a Royal Commission appointed, he would be accepted as a scientist. I have often wondered why a man who was actually doing as well as he was financially, who stood as well in the mind of the public as he did, and who himself was convinced of the sound scientific policy which he was promulgating, should have cared what the physicians of his time thought. The only explanation which comes to my mind is the idea that perhaps he, like the rest of us physicians, felt that if he could not have

MEN AGAINST MADNESS

the approval of his confrères, and that if he could not do something for legitimate and orthodox medicine, regardless of emoluments and popularity, his life would still be a failure. So important was Mesmer in France at this time that he had no difficulty in securing a really high-class commission. There were no second-raters on it. Among its membership were Lavoisier, the chemist, Bailly, the astronomer, and Benjamin Franklin, who was renowned as a scientist, and who at that time happened to be the American minister to France.

We might make note that at this time Franklin was not in his intellectual heyday. He was seventy-two years of age, had begun to be a little conservative, and his well-known sense of humor had commenced to desert him. We might have expected, had he been somewhat younger, that at least he could have seen the humorous side of the Mesmeric situation but, instead, he joined with his confrères in condemning Mesmerism. One can scarcely see how the commission could have done otherwise. Mesmer was no longer practicing medicine. He did not visit patients, nor have them come to his house as a legitimate physician would, but he drew masses of them together, wore a purple nightshirt and waved a wand during his "treatments." If this was medicine, it was certainly a variety that no legitimate medical man could really understand. But the unfortunate thing about the commission's report was that, while the commission, as well as Mesmer, was on the verge of really making an important discovery, one which in the last hundred years has immensely proved its worth by leading legitimate psychiatrists into treatment of mental diseases and of those who are maladjusted, it failed to realize the significance of Mesmerism. It merely reported that none of Mesmer's twenty-seven tenets could be justified. Admittedly, there was no evidence of magnetic fluid, there were no tests which would reveal such a thing, and since Mesmer's whole

"QUACK" NUMBER TWO—MESMER

hypothesis depended on the existence of such a fluid, there was no justification for any of his other arguments.

As a matter of fact, the investigators made a statement which was not only true but which has a significant truth missed by all the other students in this field until the day of Charcot, whom we will later discuss—namely: that imagination was the most important thing about this form of treatment. The commission faintly realized that when the patients imagined that they were getting well, they did get well, and that the influence of their minds was sufficiently strong to heal their bodies. This fundamental truth was realized, but it was not segregated from all the untruths that Mesmer promulgated.

There was only one dissenter from this report, a very fine botanist, who felt that the favorable results of Mesmer's practices had not been stressed enough. His voice was lost in the crowd.

Dr. Guillotin, another member of this commission, was the inventor of an instrument consisting of a blade which dropped between two columns and neatly sliced an individual's head from his body. Certainly he was less of a benefactor of humanity than Mesmer. He concurred in this report, but it was not long before his instrument was coming into daily use in the French Revolution.

From the time of the report Mesmer's popularity in Paris waned. He had been spending most of his time in making complaints. The novelty of his mystical treatment had worn off. Times were changing, new interests were being developed, and soon, just before the French Revolution occurred, he was so disappointed and so disillusioned that he left France.

He returned to Vienna where he was harried by the police. Although he had been away for decades, his reputation still remained, and it did not take the authorities long to get

MEN AGAINST MADNESS

enough evidence to request his withdrawal from the community. All he had done when he got back to Vienna was to remark to an old lady that perhaps the revolutionaries in France were not as vicious as they were made out to be in Austria. This immediately placed him on the side of the revolutionaries, so that the Austrian nobility thought it would be best to get rid of him. He then went to Switzerland where, for a number of years, although he was then well past his sixtieth birthday, he practiced as a modest country physician.

For many years he was lost sight of, but his teachings were still a center of interest in scientific groups. The Prussian Academy of Science was still debating the pros and cons of Mesmerism and finally, in 1809, an acquaintance of Mesmer's suggested perhaps the old man himself might be willing to explain some of the theories. In 1812 Dr. Wolfart, a highly considered member of the Prussian Academy, was commissioned to interview Mesmer, who had refused to come to Berlin, being tired of the contentiousness of this world. When Dr. Wolfart returned from his interview with Mesmer, he was enthusiastic. He pointed out that this man was not a quack; he was just a fine old physician who had a theory which, while it might not possess any scientific validity, had done a great deal for mankind.

In evaluating Mesmer's work, I can only emphasize that it was he who first brought to the attention of the whole world the fact that mental treatment does affect bodily ailments and can be used for the benefit of mankind.

One of Mesmer's young disciples, the Marquis de Puysegur and his brother, a count, who were both French army officers, took up Mesmerism, which they learned from the maestro himself. They became interested in animal magnetism as a hobby while they were stationed in Paris with their regiment, and soon became enthusiastic members of the Paris Society of

"QUACK" NUMBER TWO—MESMER

Harmony, which was the title under which the Mesmeric Academy was operating.

After retiring from the army and going to live on their estate near Soissons, France, they continued to show their interest in the Mesmeric procedure. Chiefly this interest was manifested in their solicitude about the health of their retainers and the other peasants in the surrounding community. They were not medical men, nor were they particularly scholarly. They were, however, remarkably interested in doing what they could for their fellow-man. Rather because of the fact that they were trained in keeping military records than because they were trained in scientific methods, all their experiments with Mesmerism were accurately recorded, and these records have proved extremely valuable to succeeding generations. The work of the de Puyseguer brothers marks the beginning, perhaps, of scientific treatment of mental disorders and recent scientific treatment of ailments of all kinds through mental means.

Mesmer, much as he tried to be a scientist, kept poor records and was perhaps more interested in selling his system than he was in advancing science. But this was not the case with the two brothers. They were, first of all, humanitarians; and secondly, they were not much impressed with buncombe.

Quickly getting away from all the drapes, music, and mysticism of Mesmer's practice, they began their treatments in the outdoors. They knew, of course, that the peasants and farmers, who were their neighbors, would not only resent their use of the mystical means but probably would feel decidedly uncomfortable in a swanky parlor such as that which Mesmer had set up.

Instead, therefore, Count de Puyseguer, aided by the Marquis, received the sick under an elm tree near the center of their local village.

MEN AGAINST MADNESS

It was the center of community life. The oldsters of the community came there to discuss the crops and such news as penetrated to their community. In the evening, the young folks would gather about this tree to do courting and to indulge in country dances. And one of the recorders of the work done at the spot remarked upon the fact that the peasants were entirely convinced that the de Puyseguer brothers had bestowed upon this tree health-giving characteristics and that a mere touch of it produced remarkable effects.

The procedure of treatment which was set up was for the ill person to sit on a stone at the base of the tree and attach himself to it with a cord. Then the patients sitting around the tree in a circle touched each other's hands, and a "magnetic fluid" circulated much in the same manner as in the *baquet* seances of Mesmer. By this time magnetized iron and the magnetic concept had departed from this form of treatment. Instead, while the term animal magnetism was still used, there was some discussion to the effect that it must be something like the electric current which had recently been a subject in the center of the public eye.

The studies of Alessandro Volta and Luigi Galvani, as well as those of Benjamin Franklin, on electricity, had made the French public, together with people of other countries, sit up and take notice. Electricity was a new force; one which hitherto had scarcely been comprehended but now was apparently without limits.

One of the peasants in the village, a young man twenty-three years of age, by the name of Victor Race, had come to the Count to be treated for an inflammation of the lung. He had been quite ill, had a cough, and was uncomfortable for several days. He was given the usual treatment but, instead of having convulsions and crying out as did those patients treated by Mesmer and previously those treated by de Puy-

"QUACK" NUMBER TWO—MESMER

seguer, Victor passed into a state of apparent sleep. His mental faculties became more acute, according to Count de Puyseguer's report, and he responded only to the voice of the Count himself.

The Count told Victor, during his sleep, that he would be cured of his illness very soon. After a few treatments of this kind Victor was restored to perfect health. This was a great step forward, for it had been assumed that, without the fancy touches which accompanied the Mesmeric wand, there was little to the treatment. An earnest patient who did not want to go through convulsions, who was not attracted by the popularity of the treatment and its stylishness, rather hesitated to undergo Mesmerism, but the method of the de Puyseguers changed all that.

It was now possible to go into a deep sleep, have some instructions given to one, and then to recover. In addition, it was found that Victor could make suggestions as to treatment for other sufferers which, if carried out, had a beneficial effect. The de Puyseguer brothers found many individuals of this sort who were able to advise about treatment, and they considered these native healers. In spite of the excellent work that the brothers de Puyseguer carried out in their rural community, the bad odor which Mesmer had left about his pseudoscience had caused it to be completely rejected by reputable medicos.

In 1820 Dr. Bertrand gave a series of lectures on the subject before the public, and there were a number of other presentations by equally well-known exponents of magnetic healers. The Hôtel Dieu was sponsor of experiments which were performed by one Dupotet, and the Salpêtrière permitted two individuals by the name of Georget and Rostan to carry out similar experiments. Unfortunately these experiments on magnetic healing were carried out on hysterical patients, and

MEN AGAINST MADNESS

were not such as to encourage the scientific world to give any more credence to the subject than it had previously. Indeed, one of Georget's best subjects admitted that she had been faking during some of these seances. We must take her statement with a grain of salt, from our knowledge of hysterical women and neurotics which we have gained since that time. While she may have said that she was faking, nevertheless she was probably quite sincere at the time she was being Mesmerized. It is not an uncommon experience for those of us who have been practicing hypnosis to have a patient completely in a hypnotic state carry out our instructions, and even respond most favorably to the treatment suggestions which we give him, yet have him say after the hypnosis that he was not under any unusual influence whatsoever. So, when the patients claimed that they were just pretending, they cast doubt upon the whole procedure.

As a result of these seeming failures, the hospitals of Paris put their feet down collectively and individually on all the attempts being made to try to treat illness by means of the Mesmeric or animal-magnetic procedure. Nevertheless, five years later, in 1825, a commission was appointed again to investigate the whole matter. Leaders in the field of medicine made up this commission, and part of their report was as follows:

"The results are negative or insufficient in the majority of cases. In others they are produced by weariness, monotony, or by the imagination. It appears, however, that some results depend solely on magnetism and cannot be produced without it. These are physiological phenomena and well established therapeutically."

In this report, in another place, we find evidence that medical hypnosis, as we understand it today, was beginning to take shape. The commissioners pointed out that various

"QUACK" NUMBER TWO—MESMER

methods might be used to hypnotize a person, or, as it was called in those days, to bring him *en rapport* with the physician, and that the time might be as short as one minute or it might take an hour in order to accomplish the necessary connection of spirits. It is possible, they reported, after a person has once been "magnetized" to bring him out very quickly and to put him back in this state again very quickly. The effects produced by magnetism "are extremely varied. It agitates some people and calms others. It generally causes a momentary quickening of respiration, of circulation."

In other ways the commission described the effect that this condition had upon patients. It pointed out, among other things, the very important finding that the patient's attention is focused upon the instructions being given by the magnetizer, and that in many respects the condition resembled natural sleep. This new investigating group pointed out an essential point which is not sufficiently stressed even today, namely, that this form of treatment is legitimate and does produce results in curing disease, but, since it is a part of the armamentarium of the physician, it should be practiced only by qualified medical practitioners.

In fact, the whole report was so favorable that the Academy did not dare publish it. The Academy, when fighting Mesmer, had plenty of courage; but when some of their ideas started to break down, it was much harder for them to sustain the line upon which they had started to ride. But still even these commissioners and the others practicing Mesmerism were unaware of the nature of the whole phenomenon. They did not realize that now at the fingertips of the physicians was the means of modifying the patient's thinking processes. If he were thinking wrong thoughts, if he were worried or fearful, these symptoms could be removed by simple suggestion. Because at that time the hys-

MEN AGAINST MADNESS

terical patient was not well understood, for the cause of his symptoms could not be understood, perhaps, until Freud came along, the ability of hypnosis to cure the hysterical patient, rather than the one suffering from an actual physical disease caused by germs or injury, was not completely understood.

If it had been, there would have been no friction between the Mesmerist and the physicians. If the mind caused the symptoms, then altering the mental "set" or the mental processes should remove them. And because the mentally caused paralysis very often looked like that caused by disease, the success of hypnosis in some paralyses and its failure in others could not but confuse all the observers.

Because Mesmer's passes and the idea of Mesmerizing objects had proved successful in the past, the general rules for producing this state in a subject were only on a level of trial and error. Mental treatment was still tied up with magnetism and electricity largely because psychology was not yet a science and scientific methods could not be brought to bear upon the whole subject.

Mesmerism was based upon the fallacy that there was an electric current or a magnetic field which passed from the person doing the treatment to his patient or subject, thereby producing a healing effect. Although modern hypnotic procedures, the historical successors of Mesmerism, which are carried on today stem from Mesmerism, the theory of hypnotism is based upon a deeper and greater knowledge of human mental processes which have little or nothing to do with electricity. Mesmerism stressed "mysterious influences," while hypnotism is being approached scientifically and no supernatural features are given credence today.

At least part of the human race is not conservative. In-

"QUACK" NUMBER TWO—MESMER

dividual men seem to seize upon the newest thing. There are great numbers of faddists, and many of them do more good than their conservative confrères. When the automobile was first invented, there were, of course, the scoffers. A number of people had a chance to "get in on the ground floor" with Henry Ford, but they stated that the automobile would never be a practical thing. As the car drove down the street, at the beginning of this century, the cry of "Get a horse" was frequently heard; yet among the youthful and the alert there were many who were as anxious as possible to get into the automobile business.

But medical men unfortunately are less likely to take up with something new. In all fairness to them it must be stated that they are anxious to get every new possible means of treating a patient, but they properly feel that it is their duty, as did the Academy at the time of Mesmer, to refuse to use an "unproved" procedure, when it really is only "unprovable."

Among individual medical men, perhaps the idea of protecting the patient is less important than the fact that the new method of treatment or the new procedure pops up so suddenly that, in defense of his ignorance, the doctor must say it is no good. He knows nothing about it, and his first reaction is to condemn rather than to take a chance or to admit that he is ignorant.

Perhaps this attitude is the safe one; perhaps we are doing more for our patients if we try nothing new until somebody else has had the temerity to do so. But I seriously question whether this procedure is proper. Nowadays, when so many new things are coming, and it is so difficult to evaluate whether a new drug or a new form of treatment is of value, a doctor may perhaps be excused for not knowing the latest

MEN AGAINST MADNESS

procedure. But in the 30's of the last century, there was no such excuse, and it was about this time that the real beginning of psychiatry occurred.

In England in the early 30's lived John Elliotson, a popular and attractive man, who was in the vanguard of every new movement for the benefit of medicine. His background was such that he could afford to visit continental medical schools, and he studied, as well, at Cambridge University and St. Thomas' and Guy's hospitals. In 1817 he was appointed assistant physician to St. Thomas' but—whether because of his aggressiveness or because of the fact that he was too ambitious and had not well integrated himself into St. Thomas' clinical group—he was not permitted to give lectures until some time later.

While there is nothing to that effect in the records, I am somewhat suspicious of the fact that his colleagues were well aware of the probability that he would be able to do a better job than some of them and that his lectures would be more popular than theirs, for he is still known as having been a splendid lecturer. He carefully analyzed the topic that he was going to discuss; his reasoning was flawless; and he described conditions from case histories which were exactly to the point. Nothing more than this could be expected of a physician teaching medical students. He presented his cases and his lectures in a novel manner and apparently was much of a showman.

His type of personality was naturally the kind to which the newer methods of treatment and diagnosis would appeal. He was not only ambitious but he was fully aware that the more he used new techniques the faster he would progress. In fact, he was so well aware of this that he somewhat disregarded the influence that his discoveries or his new methods had in turning some of his colleagues against him. Quite con-

"QUACK" NUMBER TWO—MESMER

temptuous of his colleagues, he remarked that many of them knew little about medicine, and even stated that many of his celebrated predecessors in medical science knew very little about the subject of medicine. There was some reason for his attitude, for it was quite true that only in his time medicine as we know it today began to develop. Real things were happening in the medical world. The most important, perhaps, was the invention of the stethoscope.

Scientists for generations had been using, as a rule, two of their senses, feeling and sight, and occasionally a third, smell, in diagnosing disease. It was no unusual thing for a physician coming into the room of a patient to sniff and in many cases he gave a pretty accurate diagnosis without even looking at the patient or paying any other attention to him. His nose knew. Since cause and effect, so far as disease was concerned, were still so discrepant, it was not to be expected that the physician could do anything more than observe patient after patient, see what the outcome was under certain types of treatment, and use those medications and means of handling the patient which largely by chance would seem to produce the most satisfactory results. Since germs were not known, since the microscopic healing process was not fully understood, and since even the microscopic structure of the body was only beginning to become disclosed to the medical man, it was not to be expected that he could go into the cause of a disease, remove it and thus produce a cure.

It seemed sufficient to the medical men, even in the third decade of the nineteenth century, merely to try hit-or-miss methods of treating the patient. Certain physicians had what we now call clinical sense. After seeing thousands of patients, observing the way they looked, smelling them and feeling them, they had an idea of what was likely to be the outcome of each case. They knew that if they gave drugs of one sort

MEN AGAINST MADNESS

or another, the outcome was likely to be favorable. The method of the butcher and of the mechanic, rather than that of the scientist, was applied in the sick room. There were no antiseptics. Amputation was the preferable means of dealing with a wound of a limb. Bleeding was stanched by searing in the same way the cook in the kitchen stops juice from oozing from a roast.

In addition to the use of the sense of touch, of sight, and occasionally of smell, hearing was to be brought into play by the invention of the stethoscope. Any patient who has had a physical examination knows how important is the stethoscope to the present-day physician. He knows, after having some experience, that certain sounds heard through this inverted megaphone are clues of disease. When these sounds are heard, he knows perhaps that there is a "leaky" heart, an infection of the bronchial tubes, or a collapse of the lung.

After physicians have heard these sounds for generations, and have had the opportunity in thousands of cases to see by autopsy what the diseases did to the body to produce these sounds, they have become very dependent on the stethoscope.

The young physician Elliotson was the first one to bring back from the Continent this piece of apparatus. It had not yet become the glistening, flexible object which our physician uses today. It was simply an inverted megaphone, a flat piece with a hole in it which was placed against the patient's chest, and from which came a conical tube, larger at the end that the physician pressed against his own ear. Anyone with imagination can see how silly a doctor must have looked sticking this small wooden object against the chest, bending his head down to listen, and young Elliotson was made the butt of many a quip on the part of his confrères in the London Hospital.

When he was first seen with this instrument, the remark

"QUACK" NUMBER TWO—MESMER

was made: "Oh, it's just the thing for Elliotson to rave about."

And another doctor was said to have asked him, when he saw it on his table, "Ah, do you use that hocus-pocus?"

Elliotson tried to tell him that, in his opinion, it was a valuable adjunct to diagnosis but was squelched with the contemptuous remark that he would learn nothing from it and probably could not treat disease any better because he had it.

Elliotson's aggressiveness had a splendid outlet when University College of the University of London was established. He worked day and night organizing, creating, and offering suggestions, and he was said to have been mainly responsible for its fine development up to the present day.

About the time when Elliotson was doing this organizing, a French Mesmerist visited England. It was to be expected that a man of Elliotson's disposition would seize upon this new technique of treating the sick. He tried Mesmerism in his own way. Occasionally he treated a patient here and another one there, and he had rather good success. In fact, his success was sufficiently great so that his occasional cures in the ward attracted so many students to him that it was necessary for him to make Mesmeric demonstrations in the amphitheater.

In his way he was as anxious to serve humanity as Mesmer had pretended to be, but he was never led astray by the drama of his work. And Mesmer, too, in contrast, was limited in that he had his one hobby to ride and made no other contributions to medicine which would justify his being considered a serious researcher.

Elliotson, on the other hand, was the first to administer quinine in the heroic doses which the cure of malaria demands. He first recognized the value of potassium iodide, and he was the earliest physician of whom we have record to use

MEN AGAINST MADNESS

copper sulphate, which was a useful drug at one time in the treatment of diarrhea. Creosote, which today is used as a disinfectant, found its first application at his hand; and iron, a drug which is still used by old-fashioned practitioners with some degree of success in the treatment of St. Vitus dance, was one of his contributions to medicine. Naturally there has been a modification of the use of these drugs. Quinine probably is the only one which has held its value to the present day, because our knowledge of the function of the intestines and of the fact that St. Vitus dance is caused by a germ has modified our treatment of diarrhea and of the latter disease.

Elliotson's popularity was largely among his students. The old-fashioned physician resisted his contributions, and again politics played the same part that it did in so many others of the careers which we have already considered. The better the work that he did in hypnosis, the more the opposition. Finally, official opposition to his work led him to resign his hospital connection, but this did not discourage him.

He continued with Mesmeric treatment, even though he had to sacrifice his friends, his practice, and his position in the medical field. Like all doctors who sincerely feel that they have a real contribution to make to science, he always hoped that medicine would accept hypnosis as it did his contributions in the field of drug therapy.

Before he resigned from University Hospital, he was called to the Dean's office, and the following conversation quite likely ensued:

Dean: "Dr. Elliotson, I have spoken to you before about this Mesmerism business which is giving the hospital a black eye."

Elliotson: "But, Dean, if you will recall, Mrs. Smith on the

"QUACK" NUMBER TWO—MESMER

ward came in quite ill day before yesterday and, after I had given her two treatments, this morning she walked out. That's the fifth patient whom we have had in the past two weeks who has profited by this treatment."

Dean: "I think it's all tommyrot. It's hard for me to believe that just talking to 'em and waving your hands in front of 'em would produce any cure."

Elliottson: "Well, you can't deny that these people have come in sick and they have gone out saying that they felt well."

Dean: "They're mostly hysterical women. You know that. You know how the French Academy reported about hysteria. They said that these women just pretend to get well; that there's really nothing to Mesmerism."

Elliottson: "On the other hand, the Academy did point out that it's a useful method of treating. You said the same thing when I started to use potassium iodide, and when I started to increase the doses of quinine."

Dean: "There may be something to what you say. Suppose I admit that this is a good way of treating. After all the public isn't ready for it yet. The most important physicians in London, whose opinions we must respect, say that there is nothing to it, and they laugh at our school. You have been one of the most anxious to build up our reputation. You've worked hard, and you've said again and again that the University of London Medical College is the one thing that you have closest to your heart."

Elliottson: "That's very true, and I think that if we cure more people here, sooner or later they will recognize the fact that the University of London is doing things that they are not doing other places."

Dean: "You must remember, Dr. Elliottson, that we must

MEN AGAINST MADNESS

not risk the loss of public favor, even though this method is really a wonderful one."

Elliottson (in a rage) : "This institution was established for the discovery and dissemination of truth. To me all other considerations are secondary. I think that we should lead the public, and not allow the public to lead us. The only thing that I think that we should consider is whether this is a proper thing that we are doing, and I do think that it is."

In 1838 the Council of the College passed a resolution instructing the hospital committee to take such steps as it deemed advisable to stop the use of Mesmerism in the hospital. There was nothing left for Elliottson to do but to resign, and after that he never passed within the portals of either the University College or the hospital connected with it. The insult was a dastardly one, prompted equally by jealousy and ignorance. And there was a more marked indignity in treating him in this way than there would have in serving almost anyone else similarly, for he had devoted the major part of his time to the institution up to then, and he was Senior Physician.

Eight years later it was his turn to present the Harveian oration and, with characteristic courage, in spite of the fact that he was assailed on all sides, he not only made this oration but he devoted it to the subject of Mesmerism. Some of the remarks which he made at that time remain classics to the present day.

His argument was that medicine was changing, that, to draw a parallel, a generation previously quinine was not used in sufficiently large doses really to control malaria, and that boiling oil was poured on gunshot wounds. He showed how in such a short time changes in these techniques had come. He claimed, and quite honestly, that he had already shown that Mesmerism could be used to put people to sleep during

"QUACK" NUMBER TWO—MESMER

an operation, for it could produce sleep and ease in sickness, and, too, many diseases had been cured by him Mesmerically whereas other methods had failed in these cases.

When one realizes that most treatments in those days were hit-or-miss, and that there were few specific drugs that really cured any diseases, one might well ask himself why should there have been any prejudice against mental healing as against the current indiscriminate use of drugs.

Elliotson had many sympathizers, even in the medical profession, and his fame spread far and wide, but most important was the fact that he was the first whom we know of to recognize the fact that there were certain symptom-complexes in which Mesmerism was useful. For instance, he pointed out that hysteria, which now had begun to have a typical disease picture—that is, its symptoms were being recognized as different from those of other diseases—could be treated by this method. He pointed out that these diseases were misunderstood and that physicians, not recognizing the mental nature of them, tried to cure them by bleeding, blistering, and giving miscellaneous drugs which had practically no value. A very modern comment was made by him, one which brings to mind comments heard again and again by the medical profession during the present era, namely, that the maiden lady suffering from nervous disease, should not be encouraged to get into a sexual affair. We can interpret from this that he recognized that there was a sexual background for hysteria. The thwarted wife or the unmarried woman who had had no outlet for her sexual nature, or a man who had marked inferiority feelings because of sexual inadequacy was more prone to develop diseases of the nervous system which had no basis in infection or injury, and in which there was no actual anatomical change in the brain or the body, than a person who was well adjusted sexually. Failure

MEN AGAINST MADNESS

to adjust sexually in an extramarital relationship would aggravate the symptoms, because of the feelings of guilt which would be set up. So his condemnation, which is echoed even today, that it was dangerous to suggest sex relations for the unsatisfied woman reveals to us how alert the man really was.

He pointed out what we know now: that the disease hysteria with its paralyses was not connected with the uterus as the Greeks thought, nor is it confined to the female sex. He suggested what Charcot later proved, that these functional paralyses occurred because of mental derangement, had nothing to do with cutting the nerves or injuring the nervous system and occurred just as often in boys and men as they did in women.

It is worth while, even though it is a little out of place here, to comment upon some of the other things which Elliotson did. He encouraged surgical operations under Mesmerism, and he had a Mesmeric institution in Exeter where a Mr. Parker, a surgeon, claimed to have Mesmerized twelve hundred persons and to have performed two hundred painless surgical operations. These reports were ignored by the legitimate medical journals and the only reason Elliotson was mentioned for a number of years was to abuse him. When Mr. Ward, a surgeon, reported to the Royal Medical and Chirurgical Society that in 1842 he had amputated the thigh of a man in Nottinghamshire, and that the patient had lain perfectly calm during the whole operation, he was heartily condemned. Marshall Hall made the comment that the patient must have been coached or was an impostor, because it would have been absolutely impossible for him to be operated upon without showing some reflexes in the other leg. We know now from vast experience with hypnotic treatments that the reflexes can be placed entirely in abeyance during a deep hypnotic sleep.

"QUACK" NUMBER TWO—MESMER

Eight years afterward Dr. Hall claimed, at a meeting of the Society, that this patient had confessed that he had suffered during the operation, but when Dr. Hall was challenged to state how he had gained this information, he admitted that it was through a third person and that this person did not want his name involved—truly an unscientific and highly emotional state of affairs. A Dr. Ashburner attended the next meeting armed with a signed statement from the man, who was still alive, that he had felt no pain during this operation, but the Society would not permit him to read it.

Elliotson assailed other medical errors. He was contemptuous of blood-letting, a proceeding which was popular and occasionally had some value in the treatment of disease, but he pointed out what was later acknowledged, that the indiscriminate draining of blood from a sick person was more likely to cause death than recovery. Elliotson further decried fashion in medicine. He pointed out that physicians have a tendency to ride hobbies. In Elliotson's day all diseases were ascribed to the liver for a while, then perhaps to the spleen, and, at the time that he let out his blast against this kind of "one-track" thinking, he said he was sick and tired of hearing that kidney disease was responsible for all ailments.

How refreshing and modern this is!

Within the present decade tonsil after tonsil has been removed to cure rheumatism, or for no better reason than that, if there was no other apparent cause, the tonsils might be the cause of some disease. More recently medicine has had the fad of ascribing all ailments to the endocrine gland. While it is true that physicians will tend to use again and again that technique which has proved satisfactory, the fact that Elliotson would advocate a more flexible type of thinking shows the type of man he was. And Elliotson was willing, even when he became thoroughly sold on Mesmerism, to use it only where

MEN AGAINST MADNESS

he thought it was indicated, and he never excluded other methods for it. To the last, he persisted in trying to sell Mesmerism to the medical profession, and he finally died without as much recognition as he deserved, and after losing most of his very fine practice.

* * *

In 1808, on February 6, a son, James, was born to the Reverend Dr. Esdaile, of Perth, Scotland. In Scotland in those days it was not uncommon for a member of the clergy to urge upon his son the practice of medicine. While we know little of the early life of James Esdaile, we do know that in 1830 he graduated from the University of Edinburgh and obtained an appointment with the East India Company.

India at that time was very primitive. The natives were not particularly co-operative and they looked upon the English as boors, though possibly as mental giants. In India, English physicians, in turn, had the greatest difficulty in keeping track of medical progress in the homeland. It took months for mail to reach there from England and Scotland, and when a medical journal did reach a physician practicing in India, it was avidly devoured. Esdaile had some knowledge of Elliotson but, because of the furore that the controversy over Mesmerism created, it was impossible for a physician in India, even so far away from England, to be unaware of what was going on.

In 1845 it occurred to Esdaile that he might try this Mesmerism about which he had heard so much. A Hindoo convict had a rather harmless but annoying tumor of the scrotum. Opiates were used, particularly in the Indian hospitals to aid in operating, but the man complained so much of pain when Esdaile tried to inject him with a pain-destroyer that Esdaile felt perhaps he might try the same sort of thing that Elliot-

"QUACK" NUMBER TWO—MESMER

son had tried. He knew nothing about Mesmerism, except the little that he had read, but strangely enough, in spite of the physician's poorly directed activities, the man fell into a deep trance and, when Esdaile tried to operate upon him he showed no signs of pain whatsoever. Esdaile was so encouraged with his success that he repeated his experiment and soon had a number of successful operations carried out under Mesmerism which he reported back to England.

Since the controversy was still raging, his communications were ignored. But he continued his work and, when he had passed the hundred mark in his operations, he naturally thought that it might be a wise move, both to protect himself and because he thought that he would gain some encouragement, to report his work to the Government.

The State of Bengal was at that time under the control of an alert Deputy Governor, Sir Herbert Maddox, who appointed a committee of investigation. The report of the investigating committee was, strangely enough, when one considers all the opposition that there was in England to this sort of procedure, favorable, and the Governor General placed at Esdaile's disposal a small hospital. He pointed out that if Esdaile's success in performing painless operations with the use of Mesmerism did not continue, the hospital set-up was not to be renewed after a period of a year.

Esdaile performed many more painless operations, and his work was becoming so widely spread in India that, before the year was up, a number of native gentlemen sent a petition to the Governor for continuance of the hospital. In spite of this petition, and in spite of the fact that Esdaile was becoming quite beloved for the fact that he was doing such excellent work and so painlessly, the hospital was closed.

But by popular subscription, made up mostly by natives, a second and similar hospital was founded. Here the work

MEN AGAINST MADNESS

with surgery continued, and in addition Esdaile found that he could cure certain forms of epilepsy, probably hysterical "fits," and he really felt that he was making inroads into the problem of madness.

His work then began to reap the "reward" that has come to so many pioneers. He was assailed on all sides by physicians in India who said that, first of all, the natives of India liked to be operated upon, hence merely submitted to Mesmerism so that they could have an operation performed. Esdaile replied that, if that were the case, he could not see why more came to him since he had made operations painless than came previously.

A second criticism was raised that the native Hindoo was a neurotic and was insensible to pain. If that were the case, Esdaile asked, why did not all the other surgeons have the same success as he? Time and again he tried to get British medical journals to publish his results, but he was largely ignored.

Finally in the "fifties" of the last century he returned to Scotland. After reporting what he had done, he was urged to submit his results again to one of the British journals. The article which he wrote was not only ignored but was returned to him as being unpractical, and the findings were said to apply only to the East Indian and not to the European. To such lengths did prejudice go. Here was a legitimate physician. He was not considered a quack; he was well thought of by many of his colleagues, not only in India but in Scotland, and yet he was labeled a faker.

Esdaile's work was not particularly significant in building up either the treatment of the insane or a knowledge of the workings of the mind. It did show, however, how much influence the mind has upon the body. Among his cases were individuals who felt pain to such an extent that they hesitated

"QUACK" NUMBER TWO—MESMER

to submit themselves even to the needle which would bring some relief from the pain of the operation, yet were willing to submit to a complete operation under Mesmerism, allowing the knife to go into the abdomen and other vital places in the body without resistance, without pain, without complaint, and with sufficient satisfaction in the results, as Esdaile pointed out, that they sent in their friends.

Esdaile's work after he returned to Scotland was colorless; he contributed little more to knowledge. He died relatively unknown, at the age of fifty, having found the climate of Scotland too much for him after his Indian sojourn.

MENTAL TREATMENT BEGINS

OF more importance to psychiatrists than either Elliotson or Esdaile, was Dr. James Braid. Braid was a Scotsman who early in life moved to Manchester, where he practiced medicine. He was a contemporary of Elliotson's, for he practiced in the "thirties" and "forties" of the nineteenth century, and he was pretty contemptuous of some of Elliotson's ideas. It must not be forgotten that, toward the end of Elliotson's life, he had collected about himself a number of sycophants. These men were so interested in putting over Mesmerism, particularly the idea of a Mesmeric fluid, that in spite of Elliotson's own level-headedness and his anxiety to keep the affair on a scientific basis, the status of mental healing remained just about as odoriferous as it had been at the time of Mesmer.

But Braid's approach was somewhat different. In 1841 Braid attended a lecture given by a Frenchman, one Charles La Fontaine. Mesmerism in France was largely a matter of show. Devotees were laymen, and it was not at all unusual for exhibitions of Mesmerism to be merely theatrical stunts. La Fontaine was well equipped to give these demonstrations. He had a great deal of courage, a sense of humor, and was a master showman.

When he first came to England, for instance, he went to the London zoo and stared at a rather vicious lion until he

MENTAL TREATMENT BEGINS

had completely quieted the animal. His particular interest, however, was in obstetrical Mesmerism.

In 1936, the whole of the United States was agog because some obscure obstetrician in Ohio had delivered a woman of a child during hypnotic sleep. But La Fontaine was earning a living in 1841 by going from hospital to hospital Mesmerizing women who, in this condition, had painless childbirth.

I have often been asked the question why, since it is possible to produce painless childbirth under Mesmerism, is it not carried out more often instead of using ether or chloroform, which cause physical disturbance? There are, of course, two answers to this question. One is that not all people can be hypnotized efficiently; secondly, there always is danger of the patient's coming out of hypnotic sleep just when sleep is most necessary. After all, anesthesia as we carry it out today with ether, chloroform, and others of the more modern drugs, is not only painless but relatively harmless; and the anesthetic is much surer than hypnosis. The time may come, however, when we shall have educated the public and shall have developed our knowledge of hypnosis to a higher degree so that it can be used to a greater extent. But it is an amazing indication of the ignorance of the general public, of the scientific press, and also of present-day medical authorities, that they consider this form of anesthesia new, when it was used almost a century ago.

Braid attended one of La Fontaine's demonstrations. His attitude was different from that of Elliotson. Elliotson was extremely ambitious, willing to use all the newest tools, and indirectly wanted to aggrandize himself. Braid was more interested in the scientific aspect. How is it possible, he asked himself, that these results can be obtained?

He mulled over the matter, gave it a good deal of thought, tried some of the experiments in his own practice, and came

MEN AGAINST MADNESS

to the conclusion that there was a great resemblance between the sleep that the animal magnetist produced and normal sleep. If that were the case, he then reasoned, and sleep is the result of fatigue, would it not be possible to fatigue the body to produce hypnosis? Isn't it possible that the staring into the hypnotizer's eyes is merely a fatiguing process?

The one thing that struck Braid as most significant was the patient's inability to open his eyes during the Mesmeric trance, and he developed from that observation the theory that the lids of the eyes were very likely paralyzed through fatigue. He also associated the optic nerve, which in turn is part of the nervous system, with the fatiguing power of the Mesmerist. In other words, the Mesmerist, by staring into the eyes, fatigues the optic nerve; this in turn fatigues the whole nervous system. This theory he considered quite reasonable and, since that was the case, he saw no reason to talk about magnetism at all.

In order to throw magnetism completely out of the window, he devised an experiment. He tried, so far as possible, to get himself out of the picture, and he hung upon a shelf above a subject's eyes a shining object. In fact, it was the shiny neck of a wine bottle, and he placed it so that when his friend, a Mr. Walker, stared at it, the effort tired him. By placing the wine bottle in this position, he was able not only to fatigue Mr. Walker's eyes, but also to fatigue the muscles at the back of his neck. After staring at the object for a short while, Mr. Walker's eyes closed and he fell into a deep sleep.

Braid had not convinced himself that he had all the proof that he needed, so he followed this experiment with a similar one upon his wife. He asked her to gaze at a silver sugar bowl, and she promptly dropped off into a deep sleep. (Of course, we cannot tell how much of a bore Braid himself

MENTAL TREATMENT BEGINS

was. Perhaps she merely went to sleep because he was around.)

He felt that he had successfully proved that there was no magnetism passing from the operator to the subject, and that the sleep produced by the Mesmerist was a purely natural sleep due to the fatiguing of the nervous system. Braid then coined a series of words meaning "sleep of the nervous system." His first term was neuryhypnosis. He shortly dropped the first part of the word and the term hypnosis, which we now use so fluently, came into the language. Braid became an enthusiast, but, because he had an excellent medical and surgical practice, he did not lay himself open to criticism as Elliotson had done. He continued with his practice and, on the side, he tried his hypnotic experiments. He relates, for instance, the case of a young child who had been deaf and dumb since an early age. After some treatments, he found that she could easily hear words spoken in a moderate tone, and he ruled out lip-reading by stating that the speaker could be in a position where she could not see his lips move. He attempted to present his findings, a year or two after La Fontaine had been in England, to the various English medical groups, but he, too, was rejected by the conservative medicos.

And then some of his work stirred up quite a disturbance. A Reverend Mr. McNeile preached a sermon against him, linking him with the devil. At that time, of course, various religious sects were still preaching brimstone and hellfire, and the actual entity of his satanic majesty was not considered too improbable. Braid turned out a document with some degree of enthusiasm in which he pointed out that the chief criticism that McNeile had against his hypnotic experiments was that the results were inconsistent and in McNeile's opinion everything in nature was consistent. Braid's reply was that he was extremely skeptical of any satanic manipulations which were no more convincing than the results of hypnosis, and so the

MEN AGAINST MADNESS

controversy raged. Until the middle of the "fifties," Braid, like his contemporaries, secured no scientific recognition, but he continued his work and used hypnosis in his practice.

Finally Dr. Azam, a Frenchman, who had obtained Braid's earlier works, came to the conclusion that he ought to see what he was doing. After observing some of the work that Braid was doing, putting people to sleep, operating upon them, or giving them suggestions that their symptoms would disappear, with considerable success, Azam went back to France and reopened the whole subject of Mesmerism. Even at that time the work of Mesmer was treated with considerable contempt. Some of the leaders of the medical profession were still damning him up and down, and the occasional demonstrations in the Salpêtrière and the Hôtel Dieu, of which we spoke earlier, were no help in bringing his work down to a scientific level.

Nevertheless, one of the leaders of the medical profession in France, one Velpeau, communicated Azam's experiments in hypnotism to the Académie de Médecine.

Just about that time a young physician, Ambrose Auguste Liébeault, who was in his late thirties, began to study Mesmerism seriously. He had read several books on hypnotism and was already prepared for Velpeau's communication. He worked hard practicing general medicine. It was not unusual for him to start making his rounds on horseback as early as two in the morning. With his large peasant practice he was able to make experiments which some of the others had not had the opportunity of doing before. He was a shrewd bargainer. Knowing the traditional penury of his peasant clientèle, he appealed to their cupidity. When a patient would come to him for some type of treatment which he thought he could control by hypnosis, he would put the proposition to the patient thus:



A très aimable Monsieur
Carle Séguis: hommage
A. A. Liebeault

Plate XXX

AMBROSE AUGUST LIEBEAULT

MENTAL TREATMENT BEGINS

"I'll be very glad to treat you any way that you want, but, of course, you will have to pay for any medicines I prescribe or for any operations that I do. But, if you will let me treat you with hypnotism, I will not only give you that treatment for nothing, but I will also give you all the medicines which you need."

Naturally the peasants were only too anxious to get their treatment for nothing. In this way Liébeault built himself up a tremendous experience. Patients flocked to him from all over, as they always have done when free medical treatment is in the offing, and soon he was able to open his own clinic in the small city of Nancy.

This was one of the most popular places for treatment in France. Day after day it was crowded, and he passed among his patients in a quiet, self-confident manner. There was nothing of the theatrical about him. It was probable that for this reason he was able to keep out of very much conflict with his medical confrères. His treatment by hypnosis made almost no impression upon the French medical profession.

Whereas Elliotson's and Braid's position in English medicine was such that they could not lightly be ignored, although they could be contemptuously dealt with, Liébeault had no such position. He wrote a book on the subject of induced sleep which created practically no ripple on the waters of contemporary medicine. It was easy to see why this should be so. Mesmerism still had the taint of charlatanism upon it. It had nothing to do with medicine as the new school of medical men were able to see it. It was about that time, for instance, that Louis Pasteur was reporting his findings about rabies; Robert Koch had discovered the cause of tuberculosis in a microscopically minute organism; and Sir James Simpson had interested the medical public with his recent work on anesthetics in childbirth, and anesthesia then was rapidly be-

MEN AGAINST MADNESS

coming a practical technique to make all operations painless.

All of these discoveries occupied the center of the medical stage, and, if one combines the amount of talking and thinking that the medical profession was doing about these discoveries and the epoch-making climax of Joseph Lister's research and demonstrations in preventing infection in wounds by the use of antiseptic surgery, it is easy to see how the every-day application of a simple means of treatment by an obscure country practitioner would amount to nothing. But, if we remember the well-known dictum about paths being beaten to the door of a front-rank rat-trap-maker, we must realize that sooner or later work such as that which Liébeault was doing must attract some attention, and in this perhaps Liébeault was fortunate.

The attention which his work attracted was not great. At least not so great that he was contemptuously treated. Still, with the aid of a young disciple, it has made its mark in medical history. To the mental physician, perhaps, Liébeault stands in the same position that one of the great bacteriologists of his day does to the general medical man. By himself he was not a contributor. But standing on one rung of the ladder of human success in curing disease, he takes his place in an orderly ascension.

A young physician by the name of Hippolyte-Marie Bernheim had been treating a patient for four years by ordinary means. And when we say ordinary means, we must remember that in the "sixties" and "seventies" of the last century little was as yet known about medications for destroying germs, specific medications such as salvarsan, to destroy specific germs like that of syphilis; nothing was known about the many drugs which we use today, and which are derived from highly technical chemical processes. Yet medicine had already raised its head above the level of superstition. For generations

MENTAL TREATMENT BEGINS

ground owls' eyes had no longer been prescribed. None of the weird concoctions which were so popular in the fifteenth and sixteenth centuries held any place in medicine. Such drugs as foxglove, which contains the potent essence, digitalis, was already being used to treat the swelling of the ankles which was commonly known as dropsy, and which science has proved to be due to weakness of the heart. It was not, of course, known that foxglove affects the heart muscle, strengthening its beat, thus permitting the blood to absorb the fluid, but it was a matter of common knowledge in Bernheim's day among physicians that foxglove could be prescribed and dropsy would improve.

Bernheim's patient was sent to Liébeault in Nancy, largely as a forlorn hope. As so often happens today, the physician who has a rather unusual way of treating may not be very well understood, but the liberal medical man will often send a supposedly hopeless patient to him, just on the presumption that an exotic form of treatment will do no harm and may possibly do some good. When Bernheim's patient had completed his course of treatment with Liébeault, he returned to Bernheim in such a healthy condition that Bernheim was amazed.

"What," he asked Liébeault, "did you do for my patient?"

Liébeault possessed no professional secrets; in fact, he was anxious that anybody who wanted to help his patients should know as much as possible about his technique. He drew Bernheim aside and pointed out that all that he was doing was artificially inducing sleep, much as Braid had done before. He admitted that, of course, he was still using the eyes to fatigue those of his subject. Staring them down seemed to produce an excellent effect.

"But," he said, "the instructions that I give are the important thing. This artificially induced sleep makes it pos-

MEN AGAINST MADNESS

sible for the patient to concentrate his attention upon everything that I say. Things that happen in the room, noises, conversations, and other distractions which might keep the patient from wholeheartedly listening to my instructions seem to lose their effect upon him when this artificial sleep has been induced.

"I merely give him directions as to what I expect in the way of response to my treatment, and I am pleasantly surprised at the number of cases which improve with this kind of treatment. Time and time again I have said to patients, 'Your pain will disappear,' and the patient will leave very much improved. It takes a number of these treatments to do any good, I will admit, but it is very easy to give them. If you will watch me I will demonstrate my method."

The hypnotic method which we use today has scarcely been modified from that which he demonstrated to Bernheim. He and the patient sat down opposite one another, and he stared into the patient's eyes. In a low, monotonous tone he said to him: "Sleep."

He waited a moment.

"Go to sleep," he added softly. "Your eyes are getting drowsy. Your legs are getting heavy. You're feeling more sleepy."

He repeated this several times; the patient began to slump down in his chair; his eyes would droop, and suddenly he would be deeply asleep.

While he was asleep Liébeault would say to him, "When you wake up your pains will have disappeared. You will feel fine. You will be able to go back to your work as though you had never been ill."

And time and again Bernheim observed his results. So Bernheim became Liébeault's "stooge" or, perhaps, more accurately, his "front man." Although Liébeault's book was

MENTAL TREATMENT BEGINS

ignored, Bernheim's presentation of the same findings which he had observed at Nancy created a distinct furore. Both he and his master emphasized the fact that hypnosis was a normal condition, but one which could be artificially induced. The patient was susceptible to treatment and hypnosis was a tool that should be used to help the patient.

Today in every good psychiatric hospital we use this same tool. We have learned since the time of Liébeault and Bernheim that hypnosis really doesn't cure, that deeper treatment is necessary, and I will mention why later on in this volume when discussing Freud. But as a palliative measure, as a means of treating symptoms, giving relief and restoring confidence to a patient, even today hypnosis has no peer.

In our daily contacts we can scarcely deny that an imposing presence, a sense of knowing what one is talking about, and a reputation, are potent in molding another man to our will. These factors, after all, are the essence of salesmanship. How much more potent, then, must be a technique used on the patient who is anxious to be cured, who wishes to have help, and is put in a mental state where he accepts his doctor as being the one man who really can cure him? His doctor is, to him, the authority, and he can take uncritically the suggestions which the physician makes.

It was this standpoint that Liébeault and Bernheim were able to present to the medical profession, and by that time so many cases had been recorded of cures produced through hypnosis that this means of treatment had acquired some real standing in the medical profession.

There were, of course, innumerable criticisms. During one investigation potential immorality was stressed.

"Why," it was asked, "is it not possible for a man who can make these suggestions to suggest to a patient that the patient commit an immoral or criminal act?"

MEN AGAINST MADNESS

Even at the present time, we have not disproved definitely the possibility of a hypnotized person committing a crime while being influenced, but no evidence is available, on the other hand, that a hypnotized, naturally moral person's tendencies can be changed to cause him to do something vicious.

* * *

While Liébeault was practicing hypnotism in his obscure clinic at Nancy similar experiments were being carried on by Jean-Martin Charcot in La Salpêtrière.

We have already given a brief picture of that hospital, and we have pointed out how Pinel reformed the practices there. When Pinel liberated the insane from their chains, there was no such thing as a science of mental diseases. Pinel himself recognized idiocy, melancholia, the demented person and the maniac. There were no other types of mental disease, so far as he knew, but he recognized that there were different symptoms in each type. That was as far as psychiatry went. The study of organic disease of the brain was just beginning to be understood.

Gall was preaching his doctrine, but he was scoffed at by large numbers of people, and believed in by few. Microscopic work was just beginning; and, in 1825, when Charcot was born, the only real contribution that had been made for understanding either the function of the mind or the function of the nervous system was Bouillaud's suggestion that there was a particular area in the brain connected with speech.

Charcot's father was a carriage-maker. He had only a small shop of his own but he threw his heart and soul into his business and was prouder of the type of carriage that he could build than the amount of money he could make.

Naturally, such a man was not wealthy. He could not afford to educate all his children in the way perhaps that he

MENTAL TREATMENT BEGINS

would have liked, but he did try to do the best he could for them. As his four sons grew up he planned, so far as possible, to give them an education which would result in their becoming prosperous and valuable French citizens.

One day he called in his four sons.

"I have learned," he said, "a great deal about you, my boys, and I am trying to do the best I can for you. As you know I can't afford to educate all of you as I should like, but judging by the abilities that you have shown I have decided that you, Martin, shall go into business. You shall carry on my carriage-making trade. Émile, I think that you ought to go into the Army, and you, Eugène, might as well plan to enter the Navy."

He paused.

"Jean-Martin," he went on, "you are the studious one, and I shall try to educate you. You show some artistic ability and you are studious. If you would like, you shall be an artist, or perhaps if you prefer you can be a physician. It is for you to choose."

Little is known of the other boys, except that Eugène, who was apparently the least promising, whose feelings, perhaps, were hurt by this summary disposition of his future, enlisted in one of the North African regiments and eventually disappeared. Jean-Martin Charcot entered the Lycée Bonaparte, where he worked as hard as he could to acquire a medical education, to relieve his father as soon as possible of the financial burden of his care.

To secure promotion in a hospital in those days, or to get an appointment it was still necessary as in Pinel's day, to enter the Concours. This was a sort of examination in which the various contestants for a position on the staff of a hospital or hospitals of Paris would make a declamation on some prescribed subject. The one whose speech on the medical subject

MEN AGAINST MADNESS

which had been assigned for discussion made the best impression upon the judges would receive an appointment.

Charcot was a scientist and a student. He was not an orator, and when the time came to make a speech he did poorly. It seems that in his case, as in the case of Pinel, more depended upon the candidate's ability to indulge in that type of oratory which we now call hot air than upon the actual substance of the material which was being produced.

Although Charcot failed in 1857 he again became a candidate in 1860, and it seemed as though he were to lose out again. Man after man stood up and declaimed on the subject of intestinal hemorrhage until finally it came Charcot's turn. The Concours had resolved itself into two people, Charcot and a nameless opponent. The opponent's oratory was excellent. He declaimed with one arm spread-eagled in front of him. He spoke with a loud voice. He discussed the subject with all the ability of a campaign orator. Finally he closed.

But Charcot gave him a bad half-hour. He asked a few questions and, in spite of his timid voice, he completely set aside all the declaiming which the man had done. He pointedly and logically indicated that there was no justification for some of the statements that his opponent had made. Although he had not made much of a speech, he impressed the examiners with his ability to argue, if not to declaim, and with his tremendous acquaintance with foreign literature.

It was unusual in those days for French medical students to have any acquaintance with foreign languages. As a matter of fact, provincialism was the order of the day. Hughlings Jackson, the contemporary of Charcot, was unable to read German, and when his name appeared in a German periodical he was in an emotional uproar until such time as he could find a translator.

But Charcot saw the handwriting on the wall. He realized

MENTAL TREATMENT BEGINS

that communication was becoming such that scientists of every country had a right to interchange ideas. France had seen, shortly before his birth, innumerable Austrian physicians, like Gall and Mesmer, impinging themselves upon its culture with new ideas, some of which were scoffed at, and some of which were excellent.

The Salpêtrière, since Pinel's time, had started to go down-hill. It was the huge receptacle of some thousands of aged, pauperized, nervous and insane women. Any physician who had been willing to take an assignment to that hospital was looked upon with grave suspicion, for it was just a place where one could spend one's life in routine.

There was, seemingly, nothing that could be done for these patients, and it was ridiculous to make any attempt. But for Charcot, who had had his eye upon this institution for many years, it was a God-sent opportunity. The hospital, at that time, was a "city" containing about five thousand occupants, of whom about three thousand were neurotic paupers and epileptics, six hundred insane, and two hundred and fifty incurably suffering from various diseases. Three thousand cases were then, and would be today, to the anxious research mind, a gold mine of clinical material.

All the signs of the time pointed to the fact that there was a great increase in the number of neurotics and insane. The country had just gone through the Napoleonic Wars. The people were worrying about how they were to be fed. Trade was at a low ebb. There was considerable economic unrest, and the neurotics, although they were not so labeled at that time, were becoming more and more recognizable and appeared, to the interested physician, like Charcot, to be the great challenge of his contemporary medicine. Here in the Salpêtrière, was a psychiatric museum. There were all types of cases, thousands of them, many of them so near death that

MEN AGAINST MADNESS

there would be a chance to get autopsies and see what had gone wrong in the body to produce the results that one observed in his rounds through the wards.

We must not forget that it was about that time that medicine was changing its form. Physicians were not anxious just to speculate, to watch. They were checking their findings anatomically to see what caused the symptoms, and they were trying to find, if possible, a microscopic lesion. Hughlings Jackson, as you know, was doing just that in England. In fact, we might emphasize that throughout the world physicians were no longer primarily interested in effects, but were searching out causes. And tools were available, at last, which would aid them.

The first thing that Charcot did when he took over the Salpêtrière was to open a laboratory. This, perhaps, gives one an idea of what medicine was doing throughout the world. Here was the leading institution for the insane, yet there were no facilities for examining the brains of those who had died, to see what had caused their illnesses, or to examine their bodies to see what had caused their deaths. There was no way of examining their fluids to see, perhaps, if there was pus in the lungs, or whether syphilis or some similar disease had caused their demise. In other words, so far as the officials were concerned, and so far as Charcot's predecessors were concerned, the Salpêtrière was just a garbage pail into which the leavings of French society were to be dumped, there to remain until carted out and destroyed.

Charcot revolutionized nervous medicine. It is interesting to see how he differs from many who gave to the world impetus to greater discoveries than he. He differed with the findings of the disciples of Gall, who looked upon Gall as a great anatomist. He differed with Liébeault, whose theories about hypnosis are living today, while Charcot's are ignored.

MENTAL TREATMENT BEGINS

But he was a master of method. He made no statement unless he had proved to his own satisfaction that what he was saying was true. He used every modern technique at hand, and yet based his whole theory of diagnosis and treatment upon Claude Bernard's dictum that we must, first of all, observe clinically and then try to explain the physiology of why the body has gone wrong. Let us quote here some of Charcot's statements so that we can understand how he thought.

"If the clinician, as observer, wishes to see things as they really are, he must make a *tabula rasa* of his mind, and proceed without any preconceived notions whatever. Magendie, we are told, advised the laboratory experimenter to proceed aimlessly, like a browsing animal. I am almost prepared to recommend this method to the clinical observer."

Charcot insisted upon a clinical method in which one made a thorough and systematic study of the human body lying before the physician, and he also asked questions which would reveal every symptom, so far as the individual's mental ability would permit. He wanted to get a complete picture, as we call it, of the mind and body of his patient. If he found that there was disease present he tried to reconcile it with other cases which he had seen previously, and, if the individual died he tried to see, in his body in the autopsy room, what had caused the symptoms.

Before he went into the study of mental diseases he studied rheumatism and other physical disorders. He had unusual success in describing symptoms which people had not observed before, and in proving their relation to disease.

We must not forget, of course, that disease processes of germ-caused disorders could not yet be understood. Physicians did not know why they occurred. All that Charcot and his contemporaries could do was to make a complete description of the diseased part, assume that something had happened,

MEN AGAINST MADNESS

that the tissue had gone wrong, because, perhaps, the blood had been poisoned through some outside source, possibly by an "act of God." And explanations were made on this basis. Charcot introduced clinical thermometry into France, and he was the first one to begin, as we do in all big hospitals today, the utilization of experts in allied fields.

He would have the patient's eyes examined by an expert on eyes; the throat examined by a laryngologist; the ears and other parts of the body had to be thoroughly gone over by someone who was more expert in those parts than Charcot might happen to be. He admitted, perhaps, for the first time, that specialization was necessary, because he realized a fact which we now have to face, because of the immensity of the total knowledge of medicine, that no one man can know enough about all parts of the body not to require advice about those parts which he has to examine and treat but seldom.

Charcot liked to stress the fact that when there was a bad heredity the patient's family did not like to disclose it, and it was his remark about frequency of some sort of sexual disturbance in neurotic patients that caught Freud's fancy, and which was, perhaps, responsible in a way for the whole modern theory of psychoanalysis as we see it today.

Charcot was the founder of what we might now call personality studies. We must admit that from the days of Hippocrates scientists described certain personalities. There was the irritable individual, and the placid individual; there were all types with sub-groups. The novelist and dramatist, perhaps, were more responsible for analyzing characters than the scientist. It was their duty to describe what sort of man their character happened to be, and by this description they implied that certain types existed, just as, in the old melodramatic days of our American stage, the villain had a mustache

MENTAL TREATMENT BEGINS

which he could twirl, and the hero was always a singularly handsome man.

But Charcot went further than this. He pointed out that there were certain body builds which made the individual more susceptible to various diseases. The short, stocky man who had a tendency toward temper tantrums, very often acquired gout.

Disease, to Charcot, was not just an episode in the life of an individual, but rather something to which his heredity and the events of his life were bound to lead. His methods are what give him a claim to fame, rather than his great discoveries, although he did make some.

Locomotor ataxia had by his time been described. Aphasia had been described by Bouillaud and Broca; atrophy of the muscles, infantile paralysis, although it was not known by that name, and other types of paralyses had been described and classified. And then Charcot came along and reorganized all the diseases of the nervous system which cause paralyses, loss of speech, loss of sensation.

In 1867 Charcot developed a new technique, a fascinating one. The layman of today knows something about tremors; he knows that the tremulous hands shake. It is not at all unusual for some policeman in a police squad-room to look at a suspected drunk and ask him to hold out his hands. If the man's hands shake, he makes the diagnosis of drunkenness. There are probably a dozen diseases which could account for this shaking. But even the neurologists of Charcot's time, the "sixties" of the last century, had little more knowledge than the policeman has today. They made diagnosis of one kind of tremor or another kind of tremor, and each was considered a whole disease and not a symptom.

But Charcot changed all that. The first thing that he did was to try to detect the existence of very fine tremors. It is

MEN AGAINST MADNESS

easy enough to see when a man is shaky—his hand moves so rapidly back and forth that water splashes out of a glass that he is holding; but when Charcot began to fasten long, soft, white plumes to the patient's hands, even very faint symptoms of this sort could be detected.

By means of his studies of tremors it was possible for Charcot to distinguish between two diseases which his contemporaries thought to be one, but which we know today to have entirely different causes, and which any practitioner with a neurological background is able to distinguish easily.

Charcot observed by watching the tremors in patients who had these feathers attached to their hands, the fact that one of them in trying to do something with his hands had an accentuation of the tremor, that is, it got worse. In the other one the tremor remained just as bad. Beyond these findings there was nothing very significant, except that with further observation he noticed that the ones with the intention tremor, that is, the tremor that gets worse when the patient is trying to do something, also had trouble in holding his balance, causing him to lean forward when he walked, and his facial expression was dull. Upon autopsy these cases were found to have entirely different brain damage.

He made extensive studies on all sorts of these disorders of motion, and in the early stage of his career he specialized upon these entirely because they seemed to be the most obvious cases.

The insane received only routine treatment from him, although he accepted the study of the insane and the hysterical and the mentally maladjusted patient in the same way that he did those who were paralyzed or had disorders of some sense.

The diversion of his interest into other channels was not long in coming. The pavilion Sainte Laure, which housed the

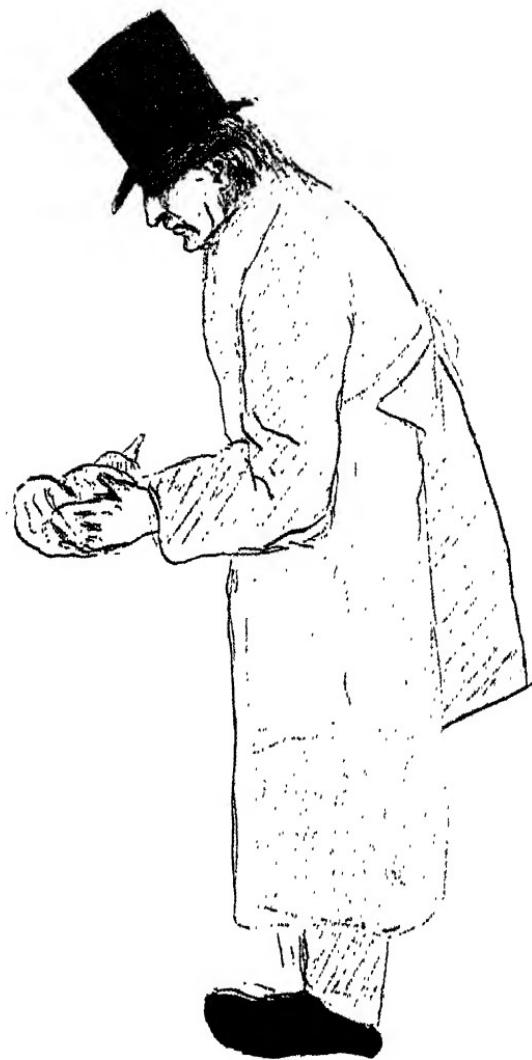


Plate XXXI

CARICATURE OF CHARCOT

Drawn by E. Brassard; from *Chauvet Artisté*, Courtesy of Masson & Co.

MENTAL TREATMENT BEGINS

patients having convulsive seizures, epileptics of various types, and the hysterical insane, was falling to pieces. It was in an extreme stage of disrepair. Plaster would fall from the ceiling, floors would warp, and large gaps appeared between the boards. During the winter the wind would whistle through nooks and crannies in the wall, and it soon became necessary that something be done for these patients. The time came when the building actually began to fall down, and it was Charcot's task to evacuate the patients. Since they had to be distributed into other parts of the institution, he took it upon himself to make some sort of classification which would make this distribution easier and more logical. He had to decide between those cases which then were called hystero-epilepsy and the true epileptic.

Hystero-epilepsies occurred mostly in young girls who were unable to meet the problems which confronted them. As they became more and more pauperized, they would have convulsions. They would fall down and lose consciousness. They would be unable to do their work. Eventually they had to be admitted to the Salpêtrière. Here they were mixed with old women who had the typical epileptic convulsions which we have described in connection with the work of Hughlings Jackson.

After the young girls had been in the wards with these other patients, their symptoms became exactly the same as those of the older inmates. It was impossible for the inexperienced practitioner to tell the difference between the two, and the problem of this difference intrigued Charcot immensely. He pointed out that in the hystericals one found, first of all, passional or logical attitudes which very closely resembled those of the true epileptic. As a matter of fact, these attitudes had much to do with the sex position, and there was a picture of sex interests in these cases. Some of his detractors made

MEN AGAINST MADNESS

fun of Charcot for finding this because, they pointed out, the disorder occurred only in the Salpêtrière where these patients had had an opportunity to observe the true epileptic.

But he did point out that there were other symptoms. There were some which casually resembled epilepsy but really were somewhat different. There were some illogical movements, and these illogical movements are those which today form the groundwork for our diagnosis of hysteria. There were places where the patient was anesthetic or was too sensitive to touch, and this fact was extremely important in the mind of Charcot. He had found that, in certain organic diseases where the nervous system had been impaired, the sensory connections between the skin and other parts of the body and the brain were actually damaged. He had verified this by autopsy. There were certain consistent changes; so that if, perhaps, the nerve in the front part of the forearm had been cut, there was a certain definite anesthetic area which occurred in every individual who had that nerve cut.

In these hysterical girls, however, the anesthesia or loss of sensation did not take a typical form. Sometimes the whole arm was anesthetic. Sometimes the anesthesia would stop at an arbitrary place in the middle of the forearm. Sometimes half of the body would be anesthetic, and yet there would be no impairment of movement. We have seen from the work of Brown-Séquard that, if there had been an injury to the spinal cord, movement on one side would have been affected, as well as the ability to feel on the other. In the hysterical, movement and anesthesia were on the same side.

Then, too, there was usually no sign of injury and no anatomical justification for loss of either the feeling or the movement. It was to these discoveries that we owe much in our present knowledge of what we call functional disease, that is, disease in which nothing can be found in the spinal

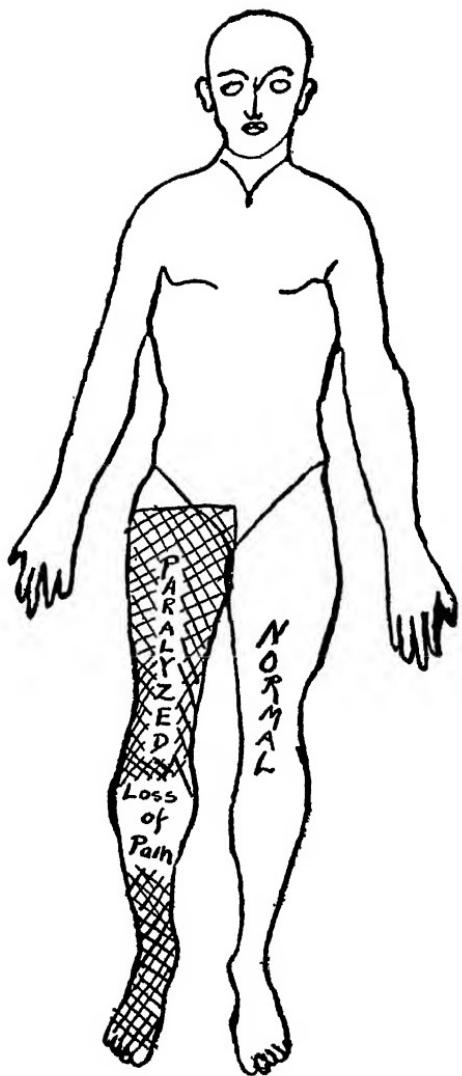


Plate XXXII

HYSTERIC PARALYSIS

If this is compared with Brown-Séquard's syndrome, Plate XXVII (page 168), it can be seen that the paralysis and loss of pain have no relationship to the anatomical distribution of nerves. The area is like a stocking and conforms only to the ignorant patient's idea of what areas are affected. Charcot emphasizes this distinction. The spinal cord is not injured—the patient believes that it is.

MEN AGAINST MADNESS

cord or the brain, upon even microscopic examination, which will justify the presence of the symptom.

Another thing that he noticed about these patients was that they made motions which had no justification; that they would grimace; they would wave their arms at periodic intervals. This was not at all characteristic of any organic disease which Charcot had studied. It is interesting to note how important it was, in recognizing the fact that there was such a thing as functional "hysteria" without real damage, for Charcot to have made his careful analyses of the actual diseases due to damage of the brain and spinal cord.

Charcot shows that these hysterical symptoms, disorders of sleep and of appetite, these tremors, artificial paralyses, and artificial posturings of limbs, were quite characteristic, that they were found the same in various individuals, regardless of their race, occupation, social condition, or age. He showed, too, that they were characteristic of the "possessed" in the Bible and the demoniacs of the Middle Ages.

Charcot was not always right, for he showed, for instance, that in some cases of hysteria the loss of sensation was exactly the same as that where the nerve was damaged; and we know today that a characteristic is the fact that it is not. He also believed that some of the lowering of temperature in limbs and similar changes of that sort were always due to emotional disturbances, and today we know they are often due to changes in metabolism or in quality of the blood, or due to actual disease of some part of the body.

It is worthwhile to note in this instance that Charcot, the great leader of his time and the one who had so much respect even from contemporary neurologists, rather lost himself when he came into the sphere of the workings of the mind. The disease of hysteria which he is responsible for segregating, which was one of his finest works, has gradually been



Plate XXXIII

HYPNOTIC DEMONSTRATION

Charcot is sitting at the far right by the table.

MENTAL TREATMENT BEGINS

dismembered by his own pupils, chiefly Babinski and Marie, who followed him as the head of his department in the Salpêtrière.

To him, nevertheless, we must give due respect, for without the basic knowledge of neurology which he used to segregate the borderline cases from those who were not insane but who had mental symptoms not affecting their ability to adjust, but only their happiness, the modern work on mild mental diseases and borderline mental diseases would never have been done.

When Charcot took up hypnotism he again proved himself to be wrong, as we have said. His theories of hypnosis were farther away from the modern concepts than Liébeault's. Perhaps, it still is suggested, in some future day we may be more inclined to agree with him than with his contemporary.

Charcot was advised not to take up the study of hypnotism because it was in sad disrepute. We must remember that in his day "Mesmerism" still flourished. It was being practiced by laymen and was considered an occult science, something like mind-reading and spiritualism. His interest was first drawn to the subject by an attempt to see if there was a change in sensation due to magnets and metals. This naturally fell right in line with the animal-magnetism experiments of some of his predecessors, and he attempted some hypnotic treatment along Mesmeric lines. He still used the passes and other techniques of the original, and it occurred to him that there must be some relationship between this type of treatment—which had, after all, produced cures—and some of the "miraculous" cures of the past. As he tried hypnosis further he, too, was able to produce cures, and in a scientific and systematic way he began to study the phenomena of this "science."

He found out that first of all there was a period of mental

MEN AGAINST MADNESS

inertia, when he could get no results from his suggestions; secondly, there was a stage of partial mental inertia, when the patient was quite rigid, and he was able to influence his patient by moving him about, as one would mould a wax figure; and thirdly, a condition of what he called "mental torpor" in which the patient was able to be influenced by verbal instructions. Since these phenomena so closely resembled those of the hysterical patients that he had been studying, he came to the conclusion that hypnosis was merely a state of hysteria and that there was something the matter with these patients in the same way that there was something the matter with those who were suffering from hystero-epilepsy. And he was able to produce the same symptoms in his hypnotized patients that he could in the hysterics. We know today that part of the reason for results of this kind is the fact that both the hysterical patient and the hypnotized patient are highly suggestible. Much of Charcot's fame, particularly among the early psychologists, is due to this theory of relationship between hypnotism and hysteria.

But Charcot was not as consistent as Liébeault. He was not as convinced of the importance of hypnosis as were many others, like Braid, and as soon as hypnosis began again to be popularized and shown in theatres, he dropped it like a hot potato. He arrived eventually at the conviction that hypnotism was an antisocial device, that it was inferior as a mode of therapy, and that he could do better with simple faith-healing or merely instructing a patient what to do. We know today that hypnosis is a much more powerful method of treatment than these, and that Charcot was definitely wrong.

Charcot only incidentally aided in the understanding of mental function. Primarily he, like many of his contemporaries, Brown-Séquard, Broca, and Bouillaud, was interested in what could be found in the brain to explain loss of

MENTAL TREATMENT BEGINS

motility, loss of intellect, or other absences of efficient bodily function. He was as interested in the man who was unable to walk but who could give an intelligent exposition of a scientific theory, as he was in the hysterical case which had trouble in meeting the problems of existence.

One would not be too much criticized if one were to say that Charcot's importance in the field of mental treatment lies chiefly in the fact that he was a very fine clinical teacher and that his students were the leading neurologists and psychiatrists and even psychologists of the next generation. He was an austere man, rather repellent in manner, and harsh and unsympathetic in dealing with his students. Yet his very careful observations and his checking of those observations with the findings on the dead body were lessons that no one could afford to be without if he were to succeed in studying diseases of the mind.

When Charcot stood on anatomical ground he had the courage of his convictions, but in dealing with problems of hysteria and hypnosis he was easily irritated. As he became more and more criticized by the press and by his contemporaries he became misanthropic, but he continued his didactic teachings in a way that was fascinating to those who came to hear him. During the time while he was teaching at the Salpêtrière, foreigners who came to Paris were willing to take the long trip to that hospital in order to attend his lectures.

Physically, he was afraid of nothing; and mentally, he assumed an attitude of courage which confounded many of his contemporaries. He worked hard in military service during the war of 1870, although he was not in uniform and he managed, in spite of the danger to himself, the cholera and smallpox cases among his sick and wounded. During the dangerous days of the Commune, he did not hesitate to make his usual rounds at the hospital.

MEN AGAINST MADNESS

He was fascinated by art and this interest which his father had discovered in his youth served him in good stead during his later years. When he traveled, for instance, as he was compelled to do because his wife was worried about the threatening letters which he had received, he took with him crayons and drawing materials in order that he might sketch anything in the foreign countries which he visited which might seem to be of interest. He visited all the art galleries that he could get to, in order to make a collection of drawings of paralyzed and other neurological cases.

In 1893, while visiting the Morvan with some of his pupils, he died suddenly of angina pectoris. He had been failing before that, and he had the tottering gait characteristic of the neurological disorder which we call *paralysis agitans*. It had been a method of teaching which he loved, to imitate the gait or a posture of a patient and among those whom he imitated were *paralysis agitans* cases, and so, toward the end of his life when he was demonstrating these cases, it looked as though he himself were the patient. He was buried from the chapel of the Salpêtrière and was given a simple funeral, in keeping with the lack of ostentation and the passion for privacy which he had shown during his whole life.

Charcot was never popular in the strict sense. He surrounded himself with a number of people who worshiped him as a great man and a clear thinker. Because of his rather icy exterior, he repelled those who were not intimate with him; and because he would not go in for show and ostentation, he never became a very significant public figure. But probably without him and his techniques, his insistence upon anatomical verification when disease had been found, some of the greatest steps in studying the mental and nervous diseases which have been made since his time could never have been carried out.

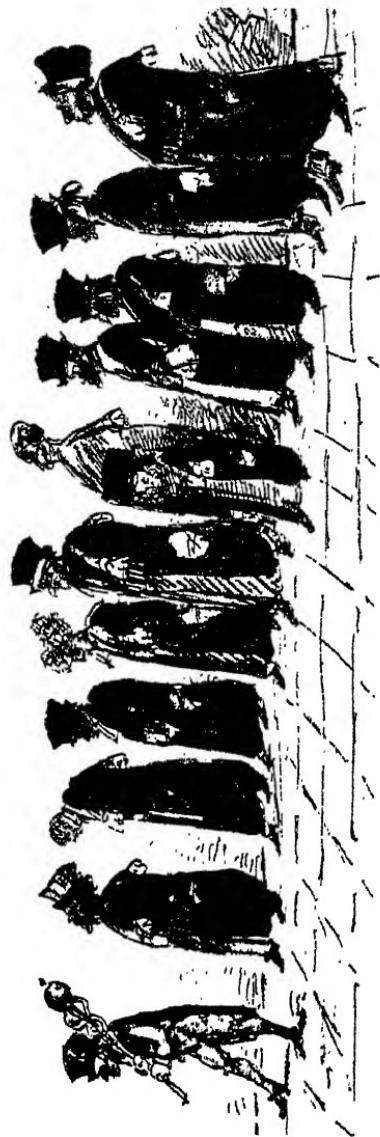


Plate XXXVII.

THE MEDICAL FACULTY OF PARIS

Charcot's own drawing which shows that he at least had the power to caricature, if not to make great contributions to art. This hangs in his library in the Salpêtrière.

From *Gideon's Art*.

THE MODERN ERA BEGINS

WHETHER the physician be concerned primarily with the practice of medicine in general, or whether his chief interest lies in the field of mental disease, he must go through the same processes in diagnosing and treating. The prime purpose of any physician is to cure his patient. In order for him to do this, he has to subscribe to certain rules of conduct so that the patient may have confidence in him, and he has to have a certain amount of education. Even in the earliest days of medicine it was recognized there was no maximum education that one could have. The Hippocratic oath, one of the oldest medical documents (possibly a forgery) points out that the physician must train his son or his benefactor's son to continue the practice of medicine.

The treatment of mental disease rests on the same plane as the treatment of any other type of disease. When a person is sick, something must be done to get him well. While it is doubtful whether the early physicians formulated their ideas on the subject very clearly, we cannot deny that nowadays we have a very definite procedure in practicing medicine, and this applies just as much to the branches of medical practice which have to do with insanity.

First the diagnosis must be made; that is, the doctor must decide what disease the patient has. When he has decided what

MEN AGAINST MADNESS

the disease is, he gives the patient medicine or some other form of treatment which he knows from his own or others' experience has helped people suffering from that disease.

Diagnosis is really only a label. It is an abbreviation, so to speak, of a vast number of ideas which have followed time and time again in a logical order to give an analysis of what produces any single disease.

For instance, a boy is standing in the street. An automobile goes by rapidly, a thud is heard, the boy is lying in the street, his leg is bent at an unusual angle, he is writhing in pain, he cannot stand up, and even the layman says, just looking at the leg, "It's broken." This is a diagnosis. It describes the condition of the bone of that leg. The layman may not know that the fracture takes one form or another, but he knows that in that leg is a straight shaft of hard material that we call a bone, and that this, like a stick snapped across somebody's knee, has been broken.

He rather implies that he knows the cause of it. He has seen the boy standing there, seen and heard the automobile go by, and then found the boy lying in the gutter. The automobile must have hit him, and it must have struck his leg or run over it. This, then, is roughly the idea of diagnosis. The only value in making a diagnosis or in classifying a disease lies in the fact that, if we know that a disease is caused by the same factor, whether a blow or a germ or too much heat or some other cause, we can begin the treatment by removing the cause. If the cause is the same, the symptoms will be the same and the treatment can be more or less the same, differing only as individuals differ constitutionally. For instance, take a case of diphtheria. There is a sore throat, fever; the physician, on looking in the throat, sees a grayish membrane. He has seen a number of cases of diphtheria during his

THE MODERN ERA BEGINS

professional career and knows that if he gives the patient a dose of antitoxin, he is very likely to recover rapidly.

It is the same way in the treatment of mental disease. As we have pointed out in the chapter dealing with paresis and the work of Wagner-Jauregg, as soon as we knew that the disease was caused by the organism of syphilis, we could treat paresis like any other syphilitic disease. When we found that the usual treatments for syphilitic disease were not as effectual as they should be, we used methods which occasionally had worked in cases of paresis and were found to be even more effective than the older methods. So we can see here the value of classification.

If we did not recognize the symptoms of paresis, we would not know that there was such a single disease, and if we did not know, we could not treat. Pinel, Willis, Bouillaud, and others whose work we have discussed in this volume were largely without that knowledge.

As a matter of fact, it was not until about 1835 that a book appeared, written by one Professor Griesinger, who taught clinical medicine and mental therapeutics, such as it was, at the University of Berlin.

Wilhelm Griesinger was the parent of present-day psychiatry. He took it in its childhood and reared it into its present lusty adolescence. Before his day, the symptoms of mental disease were just too bewildering. To the physician who interested himself in mental disorders, there seemed to be nothing so consistent as there was in the rest of medicine. Even at the beginning of the nineteenth century, general medicine had taken some shape. Physicians were able to distinguish, for instance, between what they called a catarrh corresponding to our present bronchitis, and consumption which corresponds to our present tuberculosis. The symptoms

MEN AGAINST MADNESS

were somewhat the same; there were coughing, expectoration, and fever, recognized—by feeling the patient—even though the clinical thermometer was not yet in use. The physician, however, could tell by looking at the patient that there was a difference between the consumptive and the one who just had something the matter with his nose and throat. There was a hectic flush, the eyes were glassy, the cheeks were sunken, breathing was difficult in the first case, and none of these signs were present in the second.

The story of his ailment that the patient told was somewhat different in each case. Although the modern case-history method was not yet in vogue, physicians did make some inquiries.

The sick person today expects to have his physician sit down and ask all about his past health and about the onset of his present complaint, but that was not true when Griesinger first began to practice. It was true, however, that physicians not only were becoming highly skilled, in observing symptoms systematically from the top of the head to the soles of the feet, but, because of the investigations in morbid anatomy made on a cadaver, they were beginning to link the anatomical findings with the symptoms that presented themselves.

Early textbooks of medicine of some degree of excellence appeared before there was anything worthwhile in the way of a textbook on mental disorders. There was still some humeral physiology being discussed, and the juices of the body were given more stress, perhaps, than they merited. But what could one expect when germs were not known? One could only blame disease on heredity or on some constitutional weakness—and we have seen that even that idea was not developed until Charcot's day—or on something in the patient's machinery "just going wrong," the reason for which one could not really be expected to comprehend.



Plate XXXV

TYPES OF INSANITY SEEN THROUGH 19TH CENTURY EYES

THE MODERN ERA BEGINS

Griesinger changed this picture. He came into psychiatry through general medicine. He was an expert internist before he started taking any account of mental patients. When his book appeared, it was a revolutionary step. No longer were diseases simply lumped into four large groups, like dementia, etc., and the patients who fitted into one of these groups rather than into another, merely classified in that manner. No, Griesinger pointed out that first of all we should notice relationships of symptoms, and his argument, which was like that of Charcot and which preceded Charcot's by some twenty or thirty years, was that one should treat a mental disease in the same way one would a physical disease because, after all, there must be some damage to brain tissue, to the tissue of the nervous system,—that something had gone wrong with the bodily mechanics of a person who had a mental disease.

The definite mechanistic philosophy of Descartes probably resulted in the fact that physicians were beginning to understand that there was a mechanical background for the way the human body behaved, and that life was not merely a mythical force blown into the human body by the Deity. Griesinger's textbook, appearing in 1845, smacks of extreme modernity. One could place this book side by side with a modern volume of the same nature and find but little difference, at least in the table of contents and in the approach to the subject; that could certainly not have been said of any previous work.

Descriptions of mental disease before Griesinger's time were brief. They usually consisted merely in describing how the man behaved, without any relationship to other cases of a similar nature. In other words, there was no such thing as classification, no idea of lumping cases together so that one form of treatment which had proved satisfactory in a case

MEN AGAINST MADNESS

could be used in similar cases. Griesinger was very much sold on the idea of the nervous system being responsible for mental disease, and naturally he stressed those disorders which had a definite physical basis, the diseases that we now call organic, whether they might be due, for instance, to hardening of the arteries, or a brain tumor. Where he could not find any such damage, he presumed, as a researcher is entitled to presume today, either that the technique was not all that it should have been or that he had missed something in his examination of the brain itself. Naturally, one could not expect that he would have the same concept which Charcot developed several years later, because he did not have the background that Charcot had. He had no way, for instance, of determining the fact that there was such a thing as a mental disease which arose from a mental rather than a physical cause, where the machinery went wrong merely because there was insufficient fuel or because it was run too hard, rather than because a part was broken.

For the first time the symptoms of mental disease were classified. It must be admitted that the classification accorded with rather an amateurish type of psychology, where all thinking processes were divided up in a few simple terms such as memory, will, and sensation. Disorders of sensation included those symptoms which have always been considered characteristic of mental disorders, even back to the time of the Greeks. Hallucinations in which the individual imagines that he tastes something that is not pleasant, or hears voices talking about him when there is no one around, are characteristic of disorders of sensation.

With the work of such experts as Claude Bernard, Hughlings Jackson and Brown-Séquard, the eyes of the medical world turned toward an understanding of the nervous system as the answer to the problems of insanity. Thanks to



Plate XXXVII

WILHELM GRIESINGER

THE MODERN ERA BEGINS

Griesinger, much of the mystery which surrounded mental disease had been dispelled, and a definite relationship of insanity to physical disease had been demonstrated. But not much could be done for cases unless the definite physical disorder that caused the insanity could be disclosed; and until a few years before 1900 nothing of very great significance was revealed about non-organic cases, either by the hypnotists or by those who were studying the diseased body of the insane person. It was, of course, to be expected that diseases where obvious physical changes could be noted would be the first ones to be connected with insanity. When a man who is suffering from tuberculosis had gone out of his mind, it was not difficult to see the little growths caused by the tubercle bacillus in his brain, as well as throughout the body. Insanity due to tuberculosis is not frequent. The largest group of the insane today so far as we know, have troubles not connected with brain disease, but are, instead, known to be sufferers from disorders of function of the brain rather than structure.

In functional conditions lie the greatest problems of psychiatry. One type of functional condition which Griesinger subclassified was paranoia. He recognized various types, and pointed out the outlook in them. These paranoid conditions are those wherein we often find symptoms of violence. "Paranoia" comes from two Greek roots meaning "about" and "normal," because the patient's symptoms seem reasonable and, without careful examination, normal in the sense that he is only reacting as anyone would to maltreatment.

Consider the wife who comes home from work to find her husband with a gun in his hand telling her that she has been untrue to him, whereas, as a matter of fact, all she has been trying to do is to support him because he has been gradually slipping mentally and economically. When she questions him upon his foolish belief, if indeed he gives her time to question

MEN AGAINST MADNESS

him, he reveals that he knows that she is about to leave him, because she has been trying to poison his food. He has tasted the poison day after day in his breakfast. She knows that this is not true. She has been doing the best she could to give him substantial and wholesome food.

Not only does he complain of poisoning but he tells her that she has been plotting with a gang, that her lover has allies who follow him on the street when he walks about. He may be sufficiently distracted from his idea of killing her so that she can call the Police Department or an ambulance to have him removed to a place of safekeeping. He may be hospitalized.

Griesinger was the first to analyze and study these cases. He differed from Pinel and the others who preceded him, in that they largely lumped the hallucinations into "ravings" in general. It was probable that they recognized the fact that the patient was imagining voices or visions which were not pleasant, but they failed to classify them according to their significance.

Another type of case that Pinel and Griesinger's other predecessors recognized was dementia, in which the patient did not rave, did not imagine things, but merely rambled along and seemed to be losing his mind in a progressive fashion. He became less able to take care of himself, less able to understand where he was and, in general, showed deterioration.

Melancholia, a third type, Pinel recognized as having for its chief symptom sadness, in fact, sadness to such an extent that suicide was not at all to be considered out of the question.

But Griesinger took a different attitude toward all these disorders. For instance, in the case of hallucinations, he tells of a case of a man seventy-five years old who had been mentally healthy but one day came home "terrified by a thousand visions which followed him. Wherever he looked, the objects

THE MODERN ERA BEGINS

changed themselves into frightful images; sometimes they were monstrous spiders which grasped at him in order to suck his blood, and sometimes soldiers with halberds.

"Venesection was performed on him, still the hallucinations remained, and he could not sleep. A bandage was laid over the eyes and the visions at once ceased, but returned as soon as the bandage was removed.

"Finally the patient continued the use of the bandage without interruption for a night and part of a day. He now saw the phantasms only at long intervals, and after a few days they totally disappeared. Since then the man has remained healthy."

Griesinger interprets such hallucinations as being due to some irritation of the brain in the area of sight, and it is interesting to note that Griesinger's causes of mental disease agree very well with some of those which we consider important today.

For instance, he thought that hereditary predisposition was very important. We know from certain researches that have been done recently that there is much to the hereditary background of mental diseases, although we have never yet been able to prove that insanity is actually inherited.

He stressed, too, the importance of education. The treatment which an individual receives in his childhood, to Griesinger seems to be an important predisposing cause of mental disease; the neglect of a child, an unwholesome example set by a parent, or undue severity, may predispose an individual to insanity.

As he naturally would, in an era when little was known about the actual functioning of the mind, he lumps together the remaining predisposing causes in a general group which he calls constitutional, and this term he does not use in the same sense in which Charcot did, but merely implies that

MEN AGAINST MADNESS

there are people whose constitutions are not so adaptable that they are able to stand the stress and strain of life.

Some of the other causes of disorders that he notices are still quite valid. Insanity accompanying epilepsy is known today even to the layman. Severe injuries to the head are an important cause of insanity, although probably less frequently than the layman attempts to assume. Often in my work in the court where a patient is brought in as insane, his insanity being due perhaps to syphilis or overindulgence in alcohol or to some other cause far removed from actual head injury, the parents will see me and, in an attempt to secure leniency for the patient, they will give as a defense "head injury."

Previous to Griesinger, there seems to be no evidence that there was such a thing as hysterical insanity. Today we do not admit that there is such an insanity. We feel that if a person has hysteria, he knows what he is doing, hence is not insane. He is seriously sick from a mental disorder, but not so sick that he needs protection from himself. Probably what Griesinger thought was hysterical insanity, was faking or malingering. Acute fevers, to him, were likely causes of insanity but today we find them to be rather rare.

Suffice it to say, that with this work of Griesinger, psychiatry all over the world, in England, in France and in Germany, stepped up quickly to take its place in line with the other specialties which had progressed perhaps more rapidly.

At last psychiatry was intimately linked up with medicine and the same type of philosophy and the same type of thinking was being used to classify mental disorders and to look for their causes, as well as to provide eventually for their treatment, as were applied to heart disease and jaundice.

* * *

THE MODERN ERA BEGINS

Griesinger's great contribution to psychiatry was his recognition that there were certain distinct categories of mental disease. Through his recognition of organic brain disease accompanied by insanity, this large group was split off from the "unknowable" and the same treatment was utilized on such cases as would have been used even if there had been no mental symptoms.

While Griesinger recognized different types of mental disease with no apparent cause, he failed to classify them. He was more interested in the individual patient than in classes. He was able to note certain types of delusions or hallucinations which accompanied recovery, but these were not systematized and there was little likelihood that a physician could give, from his findings, an honest and sensible estimate of the likely outcome of any given case.

All that the physician at the beginning of the twentieth century was able to do was to say, for instance, to a woman: "Your husband is insane." He couldn't say, "If we give him such and such a treatment, he will recover"; or "He has a condition which usually subsides."

But Emil Kraepelin changed this. He is the logical successor to Griesinger.

From an early date Kraepelin showed his interest in diseases of the mind. He was educated by his brother, who was a famed biologist, and at a remarkably early age he graduated from his elementary school. Kraepelin's medical education was uneventful except that he was unusually good in his studies. He early showed aptitude for psychiatric work, and was trained under some of the finest experts of his day. He soon entered a district hospital to continue his psychiatric work.

When Kraepelin in 1878 became assistant physician in the district hospital near Munich, he was somewhat disturbed

MEN AGAINST MADNESS

over the situation. If one were to ask the leading psychiatrist in the community what caused a mental disease, what the meaning of a symptom happened to be, or what the cure for the disorder was, he was usually answered simply by "I don't know."

Kraepelin was an alert young fellow, and it seemed to him that the work being done by Wundt in Leipzig offered the best opportunity of really investigating the causes of mental disorders. Wilhelm Wundt was a friendly old man who was the founder of experimental psychology.

Although William James, in the United States, had founded a little laboratory for the investigation of physiological processes closely allied to those of the mind, before Wundt founded his in Germany, nevertheless it is only fair that Wundt be given credit for having founded a new kind of psychology. No longer did psychologists speculate about how the mind worked; no longer did they investigate their own thoughts rather uncritically, but they began to set up experimental procedures.

The difference between the earlier psychology and that founded by Wundt is a very simple one. In the human environment there are so many factors which are apt to interfere with an exact examination of mental processes that the scientist never can be sure about just how accurate his judgments might be. If, for instance, he attempts to decide whether a person's memory is good or not, he judges whether he can give an account of his past behavior and past experiences, and he seldom knows to what degree that account is correct. The observer has not been able to live his life with him—follow him from place to place—and his memory for details may be weak.

Beginning with the work of Wundt, the psychologist set up definite tasks in an environment as controlled as possible

THE MODERN ERA BEGINS

in order to see what the subject's mind does. Psychology became objective instead of speculative, and psychologists observed the behavior of others.

This was not behaviorism, because at the same time that the examiner watched what his subject was doing, he usually asked him to report what he thought was going on in his mind. Behaviorists do not permit this; the observational side is what they stress.

But Wundt did set up special circumscribed problems. For instance, one of the most elementary things one can consider as a problem is the question, how quickly does the mind work? If we get into a position of danger, how quickly can we adjust to it?

So Wundt set up a simple device consisting of a light and a telegraph key. The light went on and the subject was to press the key as quickly as possible, the time which elapsed between turning on the light and pressing the key being measured on a timing device. This is known as reaction-time testing, and it was a very simple but clever experiment.

Other experiments which were carried on by Wundt and his fellow experimental psychologists were tests for the ability to distinguish differences between weights. Such phenomena as illusions were beginning to be understood.

For instance, if one has two blocks of wood each weighing the same but being of different sizes, the normal individual is inclined to judge the larger one as being heavier than the smaller. Experiments of this sort were set up and the mind was measured as far as possible.

Wundt attempted, in addition, to develop a social psychology to see what effect racial attitudes, for instance, had upon individuals.

Into this atmosphere Kraepelin stepped, and he absorbed a great deal of it. His earlier work under the direction of

MEN AGAINST MADNESS

Wundt, where, for instance, he attempted to find out what effect alcohol had on mental processes, was not particularly imposing, but the atmosphere of careful scientific observation, of setting up experiments, of reasoning out cause and effect, all served a very valuable purpose in Kraepelin's life.

In spite of the fact that he was a likable fellow and set up practically no jealousies, and had tact and unusual natural ability, he did not progress rapidly in the field of psychology, and he moved from post to post. Sometimes he would be in one location for less than a year when, seeing that there was no opportunity for advancement, he would take leave and get himself another job. The outlook did not look particularly happy for him. All the best teaching jobs were occupied, but eventually Kraepelin became a full professor and chief physician of a hospital in Dresden at the early age of thirty. After this there was no more question of his qualities not being recognized. He soon went to Heidelberg, where his lectures and his studies changed the whole aspect of psychiatry. His methods were unique.

Accompanied by his students he would make rounds, and it was an axiom of his that he would not permit before examination any discussion of the probability of what sort of disease a patient might have. By this time he had formed some of his tremendous background of observation of case material. He had watched cases develop from the very earliest stage through their whole course until the final outcome.

Previous psychiatrists were primarily interested in the question of whether the case was insane or not, or as we say today, whether it was possible to commit him to an insane hospital. Kraepelin said, "What's the diagnosis?" or "What will be the outcome?" or "How should this kind of case be treated?"

He was a splendid didactic teacher, for instead of lecturing to the students, he made them reason out their own problems.

THE MODERN ERA BEGINS

First of all, a student had to describe the disease as he saw it, then Kraepelin would very carefully outline the symptoms, using as much of the student's presentation as possible. If the student interrupted himself and asked Kraepelin a question, Kraepelin, instead of answering directly would say, "What do *you* think?", thus urging the student to come to his own conclusions. His manner was firm but kindly. He had known of, and had avoided, the arrogance that many of the German psychiatrists in high positions have always shown. Time and time again he showed new insight and ingenuity in setting up methods of teaching.

For instance, he set up a forensic seminar where a lawyer and a physician would each study a case. One would present the problem from the standpoint of the law and what should be done with the man legally; the medical man would make a diagnosis and explain what the cause of the disease was, its possible treatment and probable outcome. With this interchange of ideas, law in Germany grew closer to medicine, and there was much less discrepancy between the two disciplines there than there has been anywhere else in the world either before or since.*

Kraepelin was blessed with a sense of humor, although unfortunately it was not an unmixed blessing, for he was inclined to pun. Nevertheless, in the light of the fine contributions that he made in the study of mental disease, we can forgive him this.

Finally, between 1895 and 1904 Kraepelin published his book. For the first time a volume was brought out which flatly brought prognosis of mental disease up to the same level as disorders of the heart and lungs. Kraepelin pointed out

* I am indebted to Dr. Emil Amberg of Detroit for this information. I may comment that an English law very recently has been passed to help deal with this point. In some instances, such modern psychiatric clinics as our own in the Recorder's Court in Detroit possibly are approaching the epitome of what Kraepelin was looking for. —Author.

MEN AGAINST MADNESS

that to his mind, first of all, there were, as Griesinger maintained, definite organic diseases—those where, upon autopsy, as we have indicated before, tissue had been found destroyed in the brain.

But in that huge group that was called functional diseases, the causes were still unknown. The fact that the symptoms were all mixed up was to Kraepelin inexcusable. He pointed out that, after seeing thousands of cases, he considered there were two kinds of functional diseases that could be separated.

One was a series of disorders in which recovery occurred; the second was a group of disorders where the patient grew worse and worse. This dictum was not in itself so much of a step forward as one might imagine, but in the recoverable group he found that practically all those usually classified as maniacs and as melancholiacs, could, as a rule, be placed.

The first group, then, was called Manic-Depressive Psychosis. "Manic" comes from the Greek word *Manikas*, which simply means mad, but has been modified by use to mean raving mad; i. e., a condition accompanied by excitement. "Depressive" speaks for itself—a depressed individual is one who is "down-in-the-mouth"; he is usually so worried or sad that he has trouble thinking or acting. "Psychosis" is the medical term which is used to characterize all insanities or mental disorders which are so serious that the individual is dangerous or cannot care for himself.

The manic-depressive case is one who is unusually cheerful, over-talkative, or seriously depressed. He may mix his depression with his excitement and be sad, but active or cheerful, and yet have trouble in expressing his thoughts. On one occasion he might have an attack which starts with the characteristics of the "manic" excitement, and suddenly become characteristically depressed.

THE MODERN ERA BEGINS

In the second group of disorders were the dementias.

Several earlier observers, particularly Karl Ludwig Kahlbaum, noted that there were some dementias with characteristic symptoms. One of them was characterized by silliness. The patient would sit around and giggle for no reason at all. Eventually his mind would deteriorate so that he showed but little sense. Kahlbaum also observed another group which was characterized by rigidity. If the patient's arm were raised over his head, it might remain there for hours at a time. The term which was used later to describe his symptom is quite picturesque. It is "wax-like flexibility." In other words, the patient suffering from this disease was so suggestible that his body could be "moulded" in any position. This was known as catatonia.

The most interesting feature about Kraepelin's new classification was the fact, which he pointed out, that cases of mania were almost never observed which did not show at some time some melancholia. Often these attacks would recur at regular intervals; first an attack of mania, then of melancholia, then mania again, and so on indefinitely. Oftentimes there would be a long attack of mania, a day or two of melancholia, possibly a long period in which the patient was symptom free, and then again an attack of mania.

He considered that, in spite of the wide variation of symptoms, this was one disease, and the most important feature about it was that the patient showed more emotion than the normal individual. He called this disorder the Manic-Depressive Insanity.

In the manic stage, he noted, the patient was happier than usual, and, like all happy people, he was restless, talkative, and cheerful. When he was depressed or melancholic, his activity would be just the reverse; he would be "down in the mouth" and would have little to say, sinking in a chair, there

MEN AGAINST MADNESS

to remain for hours at a time. Sometimes this condition was so aggravated that the patient was actually stuporous; so depressed that he would merely lie on the bed with a sad expression, without enough happiness in his spirit to make him move at all or say a word. These cases Kraepelin considered definitely recoverable.

The other cases, which he called dementia praecox, a term which was not coined by him but was used in a new sense in this classification, included various types of dementia cases; the catatonics were in the group; the silly or hebephrenic individuals were also in the group; then there were some simple cases that just seemed to deteriorate without any of the rigidity or silliness of the other two groups, and he recognized that here was a separate condition.

Dementia praecox is the most common disorder known to us today. Most cases are characterized by a failure to improve unless they are given treatment. They usually are shut-in during childhood, are solitary and frequently seem more promising to their parents because they seem docile. This docility is due to their resignation as regards the problems which surround them. Where other children might actively resent lack of affection from their parents, the child who is likely to have schizophrenia (the synonym for dementia praecox) withdraws into a happy flight from reality by way of his imagination. The term, "dementia praecox," which can be translated into "early insanity" is a misnomer based on Kahlbaum's and Kraepelin's observations that these cases frequently occurred during adolescence and seldom during maturity. The newer term "schizophrenia," coined by the Swiss psychiatrist, Eugen Bleuler, is preferable because the acute onset of this disease may occur frequently, even up to maturity; some statistics suggest that the maximum frequency occurs in the late twenties and early thirties of the patients' lives. Schizophrenia is a

THE MODERN ERA BEGINS

good term because the patient is reacting in two ways: his mental life as regards his surroundings is impaired; and he has a greatly increased fantasy life. In other words, his personality is split; hence the word coming from the Greek "schizo," meaning "split," and "phrenos" meaning "mind," is apt. These patients deteriorate to a point where they cannot take care of themselves, or even to the point where they act like lower animals—not answering questions or doing anything for themselves.

Finally, Kraepelin classed with these others a group that he called "paranoid." Now a paranoiac is, as Griesinger mentions, a patient who has delusions and peculiar ideas. The word, "paranoid," like "paranoia," comes from the Greek words "para," near or about, and "noys" mind. The reason for using "paranoid" was that the earliest cases seemed to be so normal that many times their insanity was not recognized, but yet they were not true paranoia. The inventor who has a very sensible invention and has the delusion that the Standard Oil Company is trying to take it away from him may be a perfectly normal person, because it is possible that it would be to the best interests of that great corporation to keep it from being placed on the market. On the other hand, the Standard Oil Company may not even know about it, may not care about it, and may really not have anything to do with him. But he builds up a system of delusions so that he thinks he is being bothered by this corporation. The true paranoia case, of which very few do occur (in fact some psychiatrists nowadays feel that there are none) does not deteriorate. He is not truly demented. He is almost normal, except for his one system of bizarre ideas. Unfortunately such individuals as he may actually commit murders in order to protect themselves, because they think that some organization or person is against them. But as a general rule, they are just pests. They appear

MEN AGAINST MADNESS

in law courts over and over again trying to get justice. They bother officials of the "persecuting" company or a "persecuting" group. For these reasons, they must be treated as insane cases.

But in the dementia praecox group there is found the case, with similar delusions, which deteriorates, and it was this type that Kraepelin noticed. I tried to bring out earlier in this chapter how important it is to be able to segregate various types of cases. If Kraepelin was aware of the fact that there were some insane cases that got well, he implied that they had a different causation and required different treatment than those which deteriorated. If he was able to group the various kinds which deteriorated, implying that some of them might get well, and others not, and there was a consistent type of symptomatology in each sub-group, then that too suggested another form of treatment in the offing; so that modern psychiatry, particularly that dealing with the functional disorders, dates to Kraepelin.

His classification has been the basis of many studies since. It is obvious to anybody who deals with dementia praecox cases that one characteristic of all of them—whether they are likely to get well or not, whether they have delusions, wax-like flexibility, or just a silly manner—is that the emotion which they show in discussing their trouble, or in adjusting to their environmental problems is not in keeping with their background and intellectual faculty.

They may be extremely bright people, but they are unable to meet the problems of reality with the proper amount of emotion. They are not afraid of what is going to happen to them. They tell of these bizarre happenings of people following them, and making trouble for them, and show none of the apprehension, fear or other emotional signs that one would

THE MODERN ERA BEGINS

expect. So "schizophrenia," meaning a splitting of the mind, is perhaps a better term.

With the work of Kraepelin we come to the modern era of psychiatric treatment, particularly treatment of the severe mental diseases which we call the psychoses. The modern mental hospital is dependent upon the work originally done by Kraepelin and his research group, and those who have followed the course laid out by him.

One of Kraepelin's associates, Alois Alzheimer, showed that mental diseases in old folks who were not yet senile, but who were irritable, had ideas that people were bothering them, and were perhaps a little forgetful, were due to the hardening of the arteries of the brain. Another of Kraepelin's associates, Spielmeyer, made extensive studies on the brain of dementia praecox cases, and, while he found no damage which would seem to indicate a real cause, he found enough changes in those brains for us to suspect that there may be some actual physical damage to the nervous system of these cases. Perhaps chemistry will show us what it is, where the microscope never could. Following Kraepelin's work, thousands of investigations have been made. Chemists, physicists, biologists, even botanists, have brought to bear upon the problems of insanity information from their various specialties.

Society's attitude toward the insane has become humane. There is a situation in caring for the insane today which is better than that ever seen before in the history of the world.

Suppose your Uncle John were taken ill. You call in your family physician, who recognizes that this is a mental case. Very often the family physician is unwilling to take the responsibility for treating such a case, considering it a job for a specialist in psychiatry. So your family doctor calls in Dr. Brown, the psychiatrist.

MEN AGAINST MADNESS

Dr. Brown walks into the room and talks to Uncle John for a few minutes. He asks him how he is and Uncle John smiles, laughs, and giggles, wants to shake hands with him, tells him how happy he feels and, thanks to Kraepelin, the psychiatrist recognizes that he is dealing with a case of manic-depressive psychosis.

He excuses himself from Uncle John and steps into the next room with you.

"What do you think of him, Doctor?" you ask.

"Oh, he is obviously suffering from a severe mental disease," Dr. Brown reports. "It is the kind of disease which is characterized by excessive emotion. Do you mind telling me a little bit about the family history? Has anybody in your family been sick with a mental disorder before?"

You rack your brains and finally reply: "I had an aunt who had two nervous breakdowns. I think she was in a State hospital once, about twenty-five years ago."

Dr. Brown looks interested.

"Is there no one else?"

"I have a brother who is very nervous, but he has never had a breakdown. He does have some spells where he seems happier than other people, but we have never thought that he had any mental disease."

This is another bit of evidence that is useful to Dr. Brown.

He questions you further.

"What brought on this attack?" he asks.

"Why he was down South for a while trying to sell stoves in Texas. I understand that the trip was not particularly successful, and he had to wire back to his company for funds to return."

"And did they send him funds?"

"Yes, they did. He drove up to the house last night. Instead of putting his car in the garage as he usually does, he left it

THE MODERN ERA BEGINS

parked in the street about a foot from the curb. He never acted that way before. As a matter of fact, he used to be very fussy about his automobile. He came running up the walk, up the steps two at a time, banged on the door, and came in. I knew then that there was something the matter. He told me enthusiastically what a successful trip he had had, and I knew all the time that he hadn't."

"What did you do then?"

"I asked him to sit down and I talked to him a bit and he got quieter. This morning he was even worse. He was so noisy that the neighbors complained, so, of course, I called my family doctor."

"I know you did, and he called me. I think it was very wise. My advice is that we have him admitted to a private sanitarium. But before we do that, there are one or two things that I would like to know. First of all, has he ever had any breakdowns like this before?"

"No, he has been very depressed occasionally, particularly when business wasn't so good. He talked of suicide once or twice and really had us worried, but he snapped out of it."

Dr. Brown mused for a moment.

"There is a hospital near here which is not particularly expensive and where, I think, they give excellent care to patients," he said. "If it is all right with you, I shall arrange to have him admitted there tonight."

You give your consent, and Uncle John is bundled into your car and in half an hour or so you pull into the driveway of an imposing Colonial homestead, one that obviously has belonged to a very wealthy man at one time or another.

Uncle John is taken into a beautifully appointed waiting room, and you note that there is no atmosphere of mental nursing or insanity. There is no suggestion made to him at any time that he might be out of his mind. The only thing that is

MEN AGAINST MADNESS

said to him perhaps is that he should remain in the sanitarium for a while to get rested up. The term "nervous" sometimes is used in talking to him, although we doctors don't like to use it because it is misleading.

Soon the admitting physician appears, an enlightened and intelligent young chap. He is introduced to Uncle John just as any physician would be, and he sits down to talk matters over.

After Uncle John has told about his trip down South and has been a little bit noisy, clapping his hands, perhaps whistling and showing how extra good he feels, the physician suggests that perhaps he'd like to lie down in his room since he is going to stay for a little rest cure.

The patient may demur, he may say that he is not sick, but after a little wheedling and coaxing he usually goes to his room. There is no "rough stuff," there are no strait-jackets, no threats; he is treated as a decent and intelligent human being, and the doctor spends an infinite amount of time and patience getting him into a mood of co-operativeness.

Occasionally he has to be led by his arm, but because of the gentle treatment, the courtesies that he receives, it is almost unheard of for a patient to resist his admission to a hospital.

Uncle John soon shows that he is much too excited to be comfortable. It is not likely that he is going to rest during the night, with all the things that are passing through his mind. One moment he thinks he is a prize fighter and he wants to beat up all the people in the rooms near his. The next moment he thinks he is a great chef, and he wants to go to the diet kitchen and cook. He may think that he is a famous doctor, take the stethoscope out of the house physician's pocket, and head down the hall to show how he can practice medicine.

After a little friendly chat, he is quieted down temporarily and urged to take a bath. When he acquiesces, he sits in a

THE MODERN ERA BEGINS

"continuous tub," that is, a tub of water with a continuous stream flowing through it at a definite temperature. It is usually quite warm, soothing and refreshing. The patient's head is supported so that he can relax completely in a canvas cradle, allowing the water to purl about him and act as a sedative.

He may, a little bit later, be wrapped in warm blankets, which, in turn, also soothe him, and it is not unlikely that he will pass a quiet night. If he does not, he can be given the usual sleeping medicine just as though he were a patient in some hospital having nothing to do with mental cases.

All sorts of treatment may be prescribed for him. He may have long sun-baths, he may go for walks, play tennis on the grounds of the hospital, all the time being kept under observation to see that he doesn't suddenly have a depressed attack when he wants to commit suicide. His room is carefully watched to see that there are no broken glass and no sharp instruments which he might use to do harm to himself or others. Beyond that, one can see no difference between his room and an ordinary hospital room. The door is kept open, he is not locked in. It is considered very bad psychiatric technique to tie his hands. If he becomes too restless, he is allowed to "work it off." The one fear that the physician will have is that he will become so restless that he will tire himself out and perhaps die of exhaustion if this continues too long.

For that reason he is given the baths, blanket packs and soothing medication so that he will calm down. It may not be more than a few days before he recovers, although usually it takes a matter of months.

Thanks to Kraepelin, this treatment for the manic depressive cases is simple, merely a matter of keeping up the patient's strength, keeping him interested and occupied, keeping his general bodily hygiene good, and giving him as much rest as

MEN AGAINST MADNESS

possible. After he leaves the hospital, of course, the family is warned, given specific directions of how to keep him from having too much strain or worrying so much that he is likely to go into another one of these attacks.

Where a generation ago it was to be presumed that, if a person had one manic attack, he was almost sure to have a second and third, nowadays it is the exception rather than the rule.

Supposing Uncle John is suffering from dementia praecox or schizophrenia. The situation then would be entirely different. The physician would be warned that the most important thing would be to keep him in touch with reality. If he is a paranoid case and has delusions that people are making trouble for him, every precaution has to be taken to keep the "trouble-makers" away. The doctor knows that reasoning with him will make no difference, but if there are no suspicious objects about the institution to make him think that perhaps there was a dictaphone in the room, no buzzing noise—for instance, from the ventilating fans—which might make him think that people are sending rays at him, he has a better chance of recovery. In this disorder, if he becomes excited, threatens to assault people, or threatens to do himself harm, he is given hydrotherapy. He may be in a continuous tub, may be permitted to take long showers by himself, may be bundled up in bed under blankets so that he can perspire and get rid of some of the toxins in his blood.

Every effort is made to rehabilitate him mentally. The psychiatrist sits down and spends a long time with him, trying to understand what the problems are that have caused the difficulty. He and the hospital social worker may take a history not only from the family but from friends and those connected with him in business, showing how the disease de-

THE MODERN ERA BEGINS

veloped, what it was that troubled him, what events were important in his life, and even investigating his love life as a child from the standpoint of Freudian psychology.

As soon as possible he is gotten out of his room. He is not allowed to sit and mope and daydream about imaginary difficulties, and imaginary bad treatment. He is encouraged to play games which have been carefully graded for his symptoms and the disease which he manifests.

It is only fair to raise the question about whether the work initiated by Claude Bernard and Brown-Séquard had anything to do with the solution of this problem, and we can say very frankly that at this stage of the game we are not sure but that dementia praecox may have an endocrine origin, so that the glands of internal secretion, which were first pointed out by Claude Bernard and later used for treatment purposes by Brown-Séquard, may, in maladjustment, be responsible for this disease.

Certainly a recent study made by Manfred Sakel, a pre-Hitler Viennese, shows that giving an extract (insulin) of one of the glands of the body, one which is incorporated in the pancreas, very often produces recovery in schizophrenia. It is necessary, when the schizophrenic patient comes into the hospital, to put him to bed immediately and to give him doses of this gland substance so that his blood sugar will be reduced to a point where he will have convulsions and shocks. After this has been done a number of times, many schizophrenic patients get well, and apparently stay so for quite a period of time, often, apparently permanently.

We are not sure but that there might be some chemical disorder of the brain along the lines first indicated by Hughlings Jackson and Charcot. On the other hand, Charcot's idea about mental disease being of mental origin due to stresses and

MEN AGAINST MADNESS

strains, and, perhaps, as Freud indicates, due to suppressed desires, cannot be ignored. For this reason the patient is investigated, as we mentioned above, by the physician.

In some hospitals he is actually given a Freudian psychoanalysis, whereby free association: i. e., by allowing his thoughts to wander where they may with adroit questioning (although this is frowned upon by many psychoanalysts) some suppressed desire or wish is located which is responsible for the disease.

Following the line of thought engendered by Pinel, Conolly and Dorothea Dix, we look very carefully at the physical set-up of the hospital. It is undoubtedly in as fine a condition as any institution can be; the nurses are highly trained and are specialized in mental work; the physicians have had training in psychiatry; and the physical plan and appearance are in many cases those of a mansion.

Even in public hospitals it is not unusual to find a marble entrance hall with expensive furniture to give the patient a sense of well-being, not a feeling of being institutionalized. Every effort is made to make the institution as homelike as possible. Meals are served in an appetizing fashion under the supervision of a dietitian. Sometimes special diets are required when there seems to be an endocrine disease requiring them.

Every case is carefully examined physically, and any disease of the body is treated, so that no longer are the insane the rejected citizens of the world, but they are among those who are carefully tended in the hope and desire that they will get well.

Today, owing to malaria treatment in organic cases, and careful treatment of various sorts in cases of manic-depressive psychosis and schizophrenia, many cases are eventually found to be well enough to be released, and they are. If they are released, they are put into the care of a psychiatrist and a social

THE MODERN ERA BEGINS

worker who attempt to adjust the home. The family is advised what is best to be done in order to prevent a recurrence of the disease. The patient is visited in his home by a congenial social worker or a physician from time to time. Often a patient is dependent upon his physician, and considers it a great luxury to be able to come to him every week or so in order to talk over his troubles, and he gets a great deal of treatment from this relationship, regardless of what actual therapy is initiated.

It may surprise the reader to know that even in the prisons today this atmosphere is attempted when mental cases are being treated. Hospitals for the criminal insane are as well equipped as for those with any other type of mental disease. There is no such thing here as restraint, even though we know many of these people have been homicidal. If one were to enter a pavilion in an insane hospital, no matter how dangerous the patients may seem to have been before they were committed as criminally insane, we find them wandering about the grounds with an attendant, who carries no gun and is not the least bit afraid. The whole atmosphere is one of trying to treat the patient and to get him well. As we have pointed out, the endocrine gland extracts are used, serums are used, heat treatments—everything that is in the armamentarium of the regular physician, is made available for the psychiatrist.

While the insane population today seems to be numerically increasing, this apparent tendency is due rather to the fact that we are recognizing more mental diseases and hospitalizing them so that they will get adequate and early care, than to an actual increase of cases. As a matter of fact, more cures are being accomplished today than ever before, and the outlook for the future is magnificent.

* * *

MEN AGAINST MADNESS

And now, lastly, we come to one of the great contemporary names of psychiatry, probably the greatest, that of Siegmund Freud.

In discussing Charcot, I have pointed out that there were two things which were of primary importance in his work. He had not revolutionized neurology and psychiatry, but he had pointed out facts which changed the attitude of many of his contemporaries, and certainly of his students. He had pointed out that there was such a thing as a nervous disease which arose from disease of the mind and not primarily of the body. The symptoms which had hitherto been ascribed to some obscure injury or disorder of the brain and nerves, really arose from what we might call loosely "bad thinking."

In the middle "eighties" of the last century there sat at the feet of Charcot a young Viennese student by the name of Siegmund Freud. He had been born in Moravia in 1856, of Jewish parents and, like so many other young bright Jewish lads of his time, had grown up to face the problems which his race had brought upon him. He lived most of his life in Vienna and attended one of the *gymnasia* there, where, contrary to the experience of most men who later on turned out to be great contributors to medical science, he had done excellently in his studies. In fact, he had done so well in school and university that in spite of his racial background, in spite of rather a positive personality which failed to make friends in many cases for him, he was made an assistant in a medical school.

There he worked under one of the leaders in the anatomical field, a man whose organic studies partly paralleled those of Charcot but probably were not as significant, one who verified the diseases of locomotion, of thought, and of behavior by checking the finding in the cadaver.

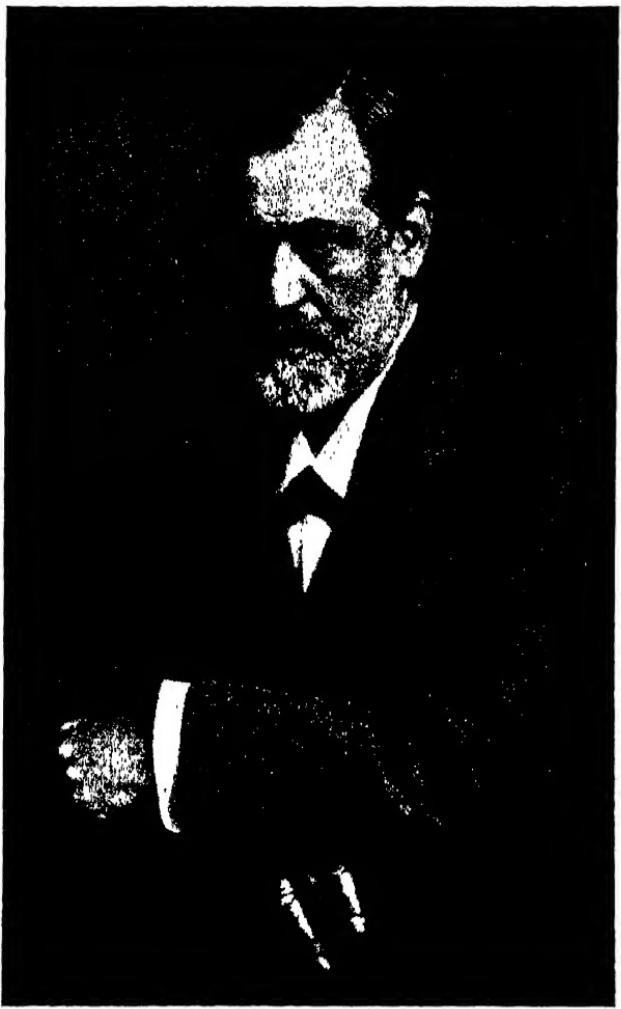


Plate XXXIX

SIEGMUND FREUD

Courtesy of Dr. A. A. BRILL

THE MODERN ERA BEGINS

Freud's appointment as instructor in the university enabled him to exercise his outstanding ability to practice medicine. He performed autopsies on cases which he had diagnosed, and verified his diagnoses many more times perhaps than did most of his contemporaries. This is strange, too, in view of the fact that Freud himself always said that he did not wish to practice medicine.

After teaching nervous diseases for some time, and after becoming thoroughly conversant with what was known about the nervous system, its functions and what happens when disease makes inroads into it, Freud entered into some correspondence with Charcot. To gain further information Freud went to Paris, where he attended Charcot's clinics. During one lecture he heard Charcot remark that his German translator had been out of touch with the great master, and Freud offered his services to translate for him. Charcot appreciated the offer, and accepted.

At that time the Frenchman was primarily interested in hysteria. He was stressing all the changes which can occur in an individual because of a bad attitude in his own mind. He pointed out that there was such a thing as a sickness which had no basis in actual physical disease of the brain, so far as one could tell.

This struck the rather romantic Freud squarely in the place where he was most susceptible. He returned to Vienna imbued with the spirit of the great Frenchman. Shortly after his return, he made a speech before the Academy of Medicine, pointing out that Charcot had said that not only could diseases exist which had their bases only in the mind, but that the disease hysteria could be found in men as well as in women (scoffing at the womb idea!). Freud was ridiculed, his ideas were condemned. In fact one speaker arose and said, "That

MEN AGAINST MADNESS

is impossible. Why the word itself comes from 'hystera,' the Greek word meaning womb, so the disease can not occur in men."

Yet, one of the leading neurologists of that time admitted to Freud that during his whole life he had undoubtedly been a sufferer from hysteria.

From 1886 to 1891 Freud did very little scientific work. He was trying to build up a private practice and to orient himself in the profession. He was still under the influence of Professor Brücke, who had taught him his physiology, and of Professor Erb, who at that time was the leading neurologist in Vienna.

In 1892 those two great men died, and it seems that at about that time Freud got out from under their influence. And then he started.

An old acquaintance of his was one Doctor Josef Breuer. Dr. Breuer was one of the leading private practitioners in Vienna. He had produced several works of great importance in physiology; one of his theories of the influence of the ear in balancing the body is still well accepted. He and Freud worked together very closely for some time, but it was not long before Freud's effervescence caused some conflict, and, intimate as he and Breuer had been, a very brisk termination came to their friendship. While both of them lived for years in Vienna, they had little to do with each other after that time.

Breuer told Freud about a case of hysteria which he had observed between 1880 and 1882.

Since he was a man of no mean intellect, Breuer made the most of what Freud told him of Charcot's studies and attempted hypnotic treatments on a young woman. Her symptoms were as follows:

During the period of observation, she reported that in one

THE MODERN ERA BEGINS

hundred eight instances she was not able to hear when someone came into the room; in twenty-seven instances she was unable to understand when several people were conversing; in fifty instances she could not hear when a single individual spoke to her. These "spells" were accompanied by forgetfulness. But when she was hypnotized, she started to untangle the threads leading into her subconsciousness. When she was not hypnotized, she had no idea why she had this forgetfulness. She just thought that she was a sick girl. When she was nursing her father, of whom she had been devotedly fond, she had fallen ill. In addition to those memory defects which she manifested, her arms were paralyzed, as were her legs. But Breuer noticed that from time to time these forgetful periods would disappear, and that at other times she would become rather bewildered.

Breuer hypnotized her every time she had one of these bewildered fits, and had her tell him each time what it was that she had thought of at that time. In that way he overcame the mechanisms that kept her from realizing what it was that was bothering her, and enabled her actually to realize some of the things that were in her memory which were conflicting and causing her difficulty. Under hypnosis it turned out that her deep attachment to her father was responsible for all her symptoms.

She had been nursing him and was under a great emotional tension at the time he had been sick. Many of the things that had been bothering her were connected with some morbid thought or some wrong thought that she had had during the time that she was attending him so that, in order to forget these things that she should not have thought of, a symptom appeared. Most of these thoughts were sexual wishes and affectionate desires which she had had for her father. Strangely enough, after she had expressed these desires, and after her

MEN AGAINST MADNESS

memories for the things that occurred during her father's sickness had been tied up with her conscious mind so that she could recall them, she got well. It occurred to Freud that the symptoms in hysterical patients were due to something that had occurred in the patient's past life.

Freud in 1889 returned to France but instead of going to Paris, he went to Nancy and there he saw Bernheim treating cases. Bernheim's method was to give a suggestion to be acted upon after the hypnotic period was over. For instance, he would hypnotize the patient and say: "At eleven o'clock you are going to pick up that chair and carry it to the opposite corner of the room."

The patient would do so, even though the hypnotic period was over. When asked why he had done it, the patient would say that he did not know and could give no reason for it. Bernheim would then keep suggesting to him without hypnotizing him that there was a reason for his picking up the chair, and eventually some of the suggestions that had been made during the hypnotic trance would come back to the patient. Freud had learned from his dealings with Charcot that under hypnosis the patient could be required to simulate hysterical symptoms. In fact, Charcot identified hypnosis with hysteria. It occurred to Freud, then, that if such were the case, and if one could remember the things that happened under hypnosis, why would it not be possible to take the hysterical patient and find out what he could remember of past events that might be responsible for his symptoms?

He worked originally with hypnosis, but hypnotism was never to his liking. He was not a good hypnotizer and he soon attempted to bring out hidden thoughts without the use of hypnosis, merely by reminding the patients again and again to remember further and further back into their past. The idea of bringing out a thought which had been hidden and



Plate XL and Plate XLI

Above: Rug weaving and Loom Room in a Modern Occupational Therapy Department.

Below: Recreation for Mental Patients -- Basketball.

Courtesy of Dr. P. C. Robertson, Ionia State Hospital.

THE MODERN ERA BEGINS

which was responsible for symptoms is known as the cathartic method because by giving vent to these thoughts and expelling them, the disease seems to be helped, and often cured.

Freud's scientific work really begins in 1893, the year after Freud's two teachers of organic diseases, Brücke and Erb, died. In 1893 Freud pointed out that the symptoms like palpitation, shortness of breath, tremors, dizziness, and other malfunctions which go with hysteria, are often a substitute for some mental disturbance which is upsetting the patient. He pointed out at that time, for instance, the phenomenon with which he is not now entirely in accordance, that one type of headache accompanied by sick stomach was due to an unconscious mental conflict, very often due to a combination, let us say, of bad sexual practices and constitutional predisposition.

Let us take a specific example of the cathartic method: A young girl is brought into the office. We do not know it but she is deeply in love with her father. She, too, is unaware of the fact for it would be abhorrent to a person of her refinement and her upbringing to have the feeling that she would like to have sex relations with her father.

The feeling is, therefore, repressed, and is in her unconscious. The subconscious is that part of the mental process in which all the thoughts of which the patient is unaware at a given time are stored, ready to break through into the conscious behavior of the patient to make him perform inexplicable acts. He justifies these acts by a process of "rationalization," which is merely to give a socially acceptable explanation for an act caused by an unacceptable subconscious idea.

The young girl becomes aware of the fact that something is wrong, because she is so fearful. She is afraid, perhaps, to cross the street, or to go up in a high building. She gets dizzy spells and faints when she rides in an elevator. These are all

MEN AGAINST MADNESS

symptoms of a neurosis; and the cause of the neurosis, according to Freud—and his explanations are borne out by analysis of many cases—is this suppressed desire for the father.

If then, by bringing her thoughts back to the place where she expressed to herself her desire to have relations with her father, the connection is again made with her consciousness and she gets the suppressed thought out of her, the feeling of guilt that she has about it disappears, and she recovers.

In 1896 Freud's father died. In his book on dreams Freud admits that this was one of the most important occasions in his life. As long as his father was alive, the younger Freud was still a child. When the father died, the son took the rôle of the father, and his whole attitude toward life changed. It is interesting, too, that Charcot, who was a sort of father person for Freud, also died about that time.

So at that time, Freud's theories of psychoanalysis were beginning to bloom, he was maturing. He pointed out, for instance, that a dream is a symbol of some suppressed wish. This may sound silly, and it may sound something like witchcraft, for we are all acquainted with the Gypsy woman who, by studying a dream, can tell us what our future is to be like.

But Freud's interpretation of dreams was not like that. Since most of these conflicts which disturb us, according to Freud, are sexual conflicts, they are no more likely to come out in their true form in dreams than they are in any other part of our lives. But they are there, and they are right in the forefront, where they could not be when we are actually conscious. For instance, if a woman is unsatisfied in her love life because her husband is impotent, she may dream of athletes, of handsome and potent and powerful young men, or even of muscular animals.

Of course, since Freud's original paper on dreams came out, thousands and thousands of dreams have been analyzed

THE MODERN ERA BEGINS

and the connection between the symbols in those dreams and actual unconscious wish has been brought out by the method of psychoanalysis. In fact, the interpretation of dreams is one of the most important tools of this method. However, it must not be forgotten that there are other factors which guide dreams. Many physiologists have pointed out that a gastric disturbance or an injury resulting in pain may also give rise to dreams. Thinking about something all day and worrying about it, will set up a dream, but even in such dreams many disciples of Freud have found symbols which represent a suppressed desire.

Freud's original idea was that every dream was the fulfillment of a wish. If a girl has had sexual wishes of some sort, the dream gives her satisfaction even though it may not actually occur as she has wanted it in her imagination, and the interpretation of her dreams goes even further. The dream may be a sort of a warning, just as the old Gypsy says, so that if the woman has a wish which eventually will master her, which may, as we know now, result in her murdering her husband, she may have a dream which by careful study and interpretation, may reveal these murderous wishes.

Without formal training in the science which has developed from these original concepts of Freud, and which is now known as Freudian psychoanalysis, one has no right to make these dream interpretations, and it is very true that many of Freud's best trained disciples make mistakes. Is it not significant that here is a new technique of finding out the thing that has gone wrong with the mind which results in hysterical and other symptoms?

We know now that people who are "compelled" to do things, like the potential murderer above, who do things without being able to explain the reason therefor, oftentimes have these suppressed unconscious wishes,—wishes which

MEN AGAINST MADNESS

make themselves known not in paralyses, not in forgetfulness, but in actually doing things which a person should not do, and, which thus act as a substitute for a suppressed wish.

It was in the year 1898 that Freud formulated the psycho-analytic theory in the form in which we find it today. There were many mental phenomena which were not fully understood, and which certainly were far from being explainable by the hypnotic technique. In spite of the fact that Bernheim had proved that not only could one resolve the hysterical symptoms by hypnosis but one could also bring them about, it devolved upon Freud to realize that it was not hypnosis primarily that enabled one to make this connection. He did realize that the important thing was to obtain the connection between the repressed element in the patient's background and the present. In other words, since the patient's difficulty was due to some suppressed desire or suppressed wish, hypnosis would enable him to get rid of this, because, by the use of hypnotic methods, one could more easily go into the patient's background and bring up things which the patient no longer remembered, but which were extremely important in the causation of the patient's symptoms.

As early as 1895 Freud reported success in bringing out these conflicts due to a suppressed antisocial act in the early years of the patient's life, without the use of hypnosis, and it was not a far step to discard the older method entirely. It was necessary, of course, that Freud develop another technique.

This technique is merely one of free association. If one just reports the ideas that come in his mind without trying to guide them, he sooner or later, perhaps after several hundreds of hours, arrives at the idea which is the sour spot in his mentality.

But there are certain elements necessary to get co-operation

THE MODERN ERA BEGINS

from the patient. The first one that Freud pointed out was the phenomenon which he calls transference; that the patient, in lay terms, must have confidence in the physician who is doing the treatment. Freud points out that this really is a form of love; that since often in a woman the conflict is due to unnatural love for the father to whom she has been deeply attached, the psychiatrist or psychoanalyst becomes a father-substitute. In this way the attachment becomes very complete and the thoughts flow more freely, thus enabling the patient to get at those things which have been sticking in her craw. The element of the psychoanalytic technique which came out first, was simple listening. Later on it was necessary to interpret. This came about because there were so many clues given in what the patient said and in other phenomena such as accidents in the patient's everyday life, that enabled the psychiatrist to start in with certain responses which might more quickly lead to the essential ones causing the illness.

It must not be forgotten that the patient has a very great number of resistances. First of all, if such a patient had none, it would not be necessary to analyze him. One would say, "What things in your past life are you ashamed of?" and the patient would merely answer frankly and that would solve the difficulty through a simple catharsis. But, unfortunately, the patient is not aware of the conflict. Sometimes it arose in such early childhood that even searching for the patient's earliest memories fails to bring it out. Sometimes the causes are far removed from the actual symptoms of disease.

In some cases the part of the body which is paralyzed is symbolic of the past behavior. For instance, a paralyzed leg might have been the place where the girl's father had rested his head when the daughter was nursing him. But, only too often, these symptoms are entirely different. A patient's symptoms might be eyeblinking, which could be a substitute for

MEN AGAINST MADNESS

the paralyzed leg, because the patient's subconscious feels that the leg symptom is too obvious and is not concealing the source of the difficulty adequately.

The next great discovery that Freud made was the fact that slips occurring in everyday life were very often clues. Freud admits, of course, that some of the things that happen during everyday life are pure accidents or are due to mistakes in perception, having very little, if anything, to do with deep conflict material. If one picks up a plate and the light shining on that plate is such that it does not reflect the greasiness of it, one might drop it because the amount of force needed to grasp it is greater than it seems to be, under the deceptive lighting. But more important is the slip of the tongue, where if one is discussing a seriously disliked person he substitutes the name of his own disliked mother, an accidental misquotation.

In the same year Freud made the discovery which is the basis of his whole theory, and which at the same time has laid it so seriously open to criticism, namely, that we have, either through tradition or through a mechanism which Freud describes, made every effort to suppress the idea of sexuality in our thoughts. There are certain types of sexuality in particular that are not discussed, or at least were not until Freud's teachings had the vogue that they now have.

What Freud recognized was the fact that even at very early years of life children have sexuality. While they do not have the normal sexual functions that they will later develop after puberty, nevertheless there are inter-sexual attractions and there are definite physiological functions which not only are a great source of pleasure but which make an infant just a bundle of pure sex. He has no idea of resistances or of difficulties that he will get into because of any sexual ideas.

By sex Freudians do not mean anything more than primi-

THE MODERN ERA BEGINS

tive tendencies. They do not necessarily refer to the mature and adult sexual act. The healthy infant feels all sorts of pleasures, sucks and enjoys the feeling of sucking, and puts anything that it can into its mouth, and in this way there becomes an association with the mother's breast.

The child can pass excreta without any control. Here again is just pure pleasure and a pure satisfaction. The child also becomes aware of the presence of his sex organs through kicking and moving about, but in infancy the sexual organs have not become the most prominent part. As one would expect, the lips are the first and most important instruments of pleasure in the child. Next is the exercise of the muscular apparatus, and then the joys of physiological comforts like those of the well-filled stomach. Of course, the child knows nothing about mature sex at this age, but there is a little early tendency to masturbate which the child gets over, remaining under control until it reaches adolescence.

The first trouble that the child comes up against is the need to use toilet equipment. When the feelings of satisfaction with physiological mechanisms is being modified; when the child is weaned from the breast and is stopped from sucking its thumb; when it is not allowed to use a pacifier—at a very early age it comes in conflict with reality, and its emotions are modified.

At that time, too, the child starts to identify itself with adults. Because it loves the mother, it tries to behave as nearly as possible in the same way that the mother does, and it is quite possible that the development of speech and walking are imitative because of the deep affection that the child very soon develops toward this parent who can walk and talk.

Freud points out that this initial stage in the development of the love life of the individual is sort of a pansexual one, when all the various physiological systems, including sex, are

MEN AGAINST MADNESS

being gratified without much control. It is here, perhaps, that Freud can most fairly be criticized. Why should the term sex be used when there are so many other gratifications, except that perhaps all are linked up with sexualism? Freud maintains, later on in the development of this theory, that neuroses and sexual perversions are merely regressions to this infantile level, and, from some analyses which have been written up by him and his disciples, there is reason to believe that he is correct, at least in certain cases, in this interpretation.

The next stage in the development of Freud's theory was the one which psychiatrists know so thoroughly, but which the layman understands poorly, namely, the Oedipus complex. When Freud was analyzing a patient, he found that there was always a deep attachment, particularly in the normal male, to the mother with a consequent rejection of the father, which even took the form, when aggravated, of wanting to cause the death of the father so that the child deeply in love with his mother could substitute himself for the father. Since he was a child, and since he knew nothing of adult sexuality except in a few cases, true sex here plays only a questionable part. But again there have been cases analyzed by excellent psychoanalysts who have found that there is a real sexual desire of the child for his mother suppressed, of course, causing the difficulty in many cases.

The signs of the Oedipus complex are very simple. Adolescent girls are often very anxious to be taken out by their fathers and are tremendously complimented if taken for their father's wives. So, often a daughter will reject the stepmother because here she has legitimate reason for being jealous of her father who has "put her nose out of joint" by rejecting her sexually for another woman. Sometimes, of course, dislike for a stepmother is due to the fact that there are other emotional conflicts, which we will not go into here. But in many cases it

THE MODERN ERA BEGINS

must be obvious. If the daughter is anxious to step into her own mother's shoes, the fact that the father will take somebody else is a source of deep conflict.

The stepfather in the same way is a challenge to the son. Freud and his disciples raised the question of whether this is not an entirely natural phenomenon. From whom else should the child learn of tenderness and love except from the parents, and who is going to make the bigger fuss over the girl child? Naturally the father will, while the mother will pay more attention to the boy. This is observable in a great percentage of cases and requires no argument.

It seems to the casual observer that, if so many of the conflicts are due to this mother or father attachment, all one needs to do is to tell the patient of them.

Unfortunately this is not the case. The patient has so covered up these ideas with various thought processes, and so disguised his wishes because the idea of incest, both psychical and physical, has become repugnant to society, that, without the extensive psychic manipulations of psychoanalysis, namely free association, one cannot get the catharsis, that is, an explosion of these suppressed desires.

One does not become aware of the cause of his symptoms by being told of that cause; he must feel for himself and repeat the suppressed experience so that it actually is attached to his conscious life.

In 1907 Freud broke up some of these earlier ideas of his. He was frank to admit that there were two types of erotic conflicts. In all of us that there is both an attachment to our own sex and an attachment to the opposite sex. If that were not the case, we would never find the boy who was glad to go out with his father just as the girl was in the passage above. One would find the girl who could not tolerate her mother in a very great excess of the number of cases which we actually

MEN AGAINST MADNESS

do see. Hence we find that there is both a masculine and a feminine part of every individual's thinking.

Among Freud's disciples was Alfred Adler who died in 1937. He was one of the earliest members of the group which surrounded Freud to spread this new type of psychology, but he had some trouble in understanding exactly what it was Freud was driving at. This was particularly true in the field of sex. Adler himself was a short, stocky man, the second in the family, and he had had a tremendous amount of ambition, which he recognized in himself. In other words, he recognized in himself a sense of inferiority, the compensation for which was making him ambitious and making him anxious to do well in the world.

In one of the meetings of the psychoanalytic group, he broached this idea to Freud and from that time on their ways began to separate. The essence of Adler's idea was that anybody who has an inferiority, whether it be due to physical weakness, economic weakness, or merely his position in the family so that he is one of the least favored of a number of children, has all his conduct dependent upon this sense of inferiority. Even more potent than the sense of inferiority in itself is the desire for power or, as it is commonly known, the ego drive.

When Adler compared his findings with those of Freud, one could see a marked similarity. Freud says that as a child grows up his basic childish sexual behavior is modified by what he is learning. He imitates because he is anxious to be like his father with whom he identifies himself. Adler, on the other hand, says that he imitates because his father is stronger, more successful and more able to cope with the problems that the child has to contend with. The much used term "inferiority complex" was adopted from Adler, but it is more than just a complex. There is this tremendous basic drive for suc-

THE MODERN ERA BEGINS

cess in all of us. We are all prone to compare ourselves with others and to pick on our weakest point for correction, or, if it is uncorrectable, to conceal it as much as possible.

In women this accounts for a good deal of the behavior, particularly of the school teacher, the spinster, and the business woman, for Adler points out that these people have a desire to do as well as men, hence they have what he calls the masculine protest, that is, a protest against the superiority of the male.

Freud uses a different expression, and he arrived at his concept through the challenge that Adler's theory offered to him.

"You cannot deny that the man who is inferior in stature, like Napoleon, uses every means at his disposal to become prominent, to become a celebrity," Adler says. "You cannot deny that there are many women who are distinctly jealous of men, while you seldom hear of men being jealous of women. How then do you account for this situation?"

Freud had to put on his thinking cap. This brought him to the conclusion that if a man loses his sexual potency, that is, if he is castrated, the world offers nothing for him. He is living, so far as moving about is concerned; but so far as concerns his being a man and having a place on earth, he might just as well be in his grave. This is a castration complex which he says is in all of us, but more perhaps in some than in others, particularly in certain types of neurotics. The woman then who is protesting against male dominance and feels inferior is really protesting against her lack of male potency. Freud really, then, means the same thing by his castration complex, about which we hear so much, as does Adler by his inferiority complex.

The only point of difference is that Freud carries over this castration fear into the fear of death, and the anxiety which is present in neurotic people again is reflected back to the sub-

MEN AGAINST MADNESS

conscious idea that potency, whether it be a real sex potency or potency in life, is lost.

Freud's modern disciples differ somewhat in their idea about the importance of the castration complex, but none of them deny that it is of some importance and it does frequently come out in cases which are studied.

It was obvious that Freud would go on further. He had to answer the question of these ego ideas which Adler brought up. They did not mean a great deal to him and have largely been discarded by his followers in favor of a deeper type of analysis.

But a concept of great importance did come out of Freud's study of the ego. This is the concept of narcissism. In studying patients with a mental disorder like schizophrenia, one finds that these people have lost touch with the outer world. They live in a fantasy life and are unable to face reality. What has happened to them is that they have become so engrossed with their own personality, with their own thoughts, with their own ideals, that they have lost touch with what is required of them actually in life. In other words, they are in love with themselves. Whereas the lover directs all his attention upon his loved ones, one finds that the lover of himself, the narcissist, turns all his attention toward himself.

One of the most obvious ways in which this love of oneself comes out is by masturbation. The ordinary person looks upon this type of behavior as a symptom of insanity, but Freud pointed out that it is merely one form of the social and physical development occurring when the personality has not developed to its full maturity, that instead of the man loving a person of the other sex, he loves himself more, and consequently the narcissism is merely a symptom of a failure of the individual to develop normal sex drives.

One of the most crushing blows sustained by modern men-

THE MODERN ERA BEGINS

tal medicine was the recent death of Freud. A scholar, and in recent years a recluse, he could have done nothing to deserve the fate that was his at the hands of National Socialism—exile after over fifty years of contribution to Austrian medicine. As might have been expected—when an old man is moved abruptly and under the harrowing conditions of impoverishment and ransom—his death occurred. The hoodlums who so maltreated him characterized his revolutionary contributions to mental medicine as a “pornographic Jewish science.” However, by calling his work science the Ministry of Propaganda has gone further than many of his more critical satellites do, for many conservative psychologists consider Freud’s contribution merely the opening of a gate into a scientific field, rather than the cultivating of that field.

Although Freud is dead, it is to be expected that his disciples, of whom there are many, will make the next contributions. And with this brief and very much compressed account of Freud’s work we bring to a close the account of the direct line of the development of the fight against madness.

* * *

We have seen how the ancients on speculation removed a bit of bone to let the devils out.

After them came a philosophical kind of psychiatry practiced by the Greeks and Romans in which the physician treated his patient logically, without too much observation of the whys and wherefores of his disease. The symptoms were on the surface and the treatment was a repetition of the experiences of each physician. If the patient were suffering from melancholia and previous melancholic cases had regained their good humor through cheerful music, that was the indicated form of treatment. And many people who are advising mental cases today or maladjusted people, are prac-

MEN AGAINST MADNESS

ticing just on that same level. One can walk into a library anywhere and find dozens of books on how to improve oneself, how to keep from getting into trouble, how to make friends, and works of similar ilk. All that these books do is to offer superficial advice that anybody with any sense could give to himself. They do not go into the mechanism of the human body or human mind, and offer no way in which the real problems which confront a person can be solved. The purchaser of the books says, when he buys a volume entitled, "How to Make Something of Yourself," that this book should be just what he needs, and that, after he reads it, he will know the way to brace up and be aggressive. All that he finds is instructions that he should put his best foot forward and make up his mind not to be timid. He has known that all the time. How then could a book help him? So we find that most of the advice given even by amateur practicing psychologists, and in books which are supposed to help mental adjustment, are way back at the level of the Greeks.

The next development was the result of the increased knowledge of anatomy and physiology. When something happened to a nerve or to a bit of the brain, there was a definite result, and while it took a long time for Gall's idea, that there were certain parts of the brain that had certain responsibilities toward behavior, to take root, nevertheless we have found that, by the time these ideas reached Hughlings Jackson's day with the help of endocrinologists, Claude Bernard and Brown-Séquard, it was possible to predicate the type of personality, or at least to change the personality due to disease of the brain, the nervous system, and the glands. We were now beginning to get a much better insight into what makes the mental wheels go round.

That was the organic side; and, accompanying certain organic diseases, we knew there was disease of the brain. We

THE MODERN ERA BEGINS

were able to see that certain tissues were destroyed; we knew that germs caused the destruction, after Pasteur and other bacteriologists had found the germ causation of disease. It was then possible in paresis to treat these germs; and finally, nowadays, to stimulate the nerves of the brain so that they will compensate for the weakness of the structures that have been injured by the infection.

Then we stepped aside a bit. No longer were we dealing with the automobile which had broken a part, but we were dealing with the motor car which has lost its way. Through the works of Mesmer and other hypnotists we have seen that the mind can be directly affected by external circumstances; that the human individual is a suggestible organism which can be put in unusual condition and whose diseases can be corrected, through mental channels. Diseases for which there was no organic basis, such as hysteria and the other neuroses and even certain types of psychoses, were presumed to have an organic basis, up to the time of Charcot. Charcot took the next forward step.

He showed that through suggestion, through phenomena akin to hypnosis, there might be genesis of hysteria. And Bernheim went further and showed that hysteria actually could be produced under hypnosis. But behind all mental disorders was a complicated mental factor. Physicians treating mental disease were only describing symptoms which they could actually observe. Their interpretations did not deal with the deeper causative mechanisms which lie behind behavior until Freud made his contributions.

Between Freud and his disciple, Adler, we began to see that there were deep-seated reasons for the presence of mental disease, minor or serious. They may have arisen out of a thwarting of the desire for power, as Adler pointed out, or they may have come from suppressed sexual desires, as Freud

MEN AGAINST MADNESS

pointed out. But these theories raised the whole level of treatment of mental diseases from the superficial guesswork stage to one of understanding that there are deep mechanisms; that one cannot treat himself by saying, "I must make up my mind to do things"; he must ask himself, "Why am I timid?"

Then, through study of his environment, his physique, the way he has been brought up, and possibly through a psycho-analysis to bring back to him his sexual suppressions, ideas about his past come to the fore and the patient understands himself better.

This brief voyage has followed a narrow course. Many other students of the mind and of the nervous system have contributed to man's knowledge of mental disease, but those whom we have discussed have best represented the development of man's armamentarium for the fight against madness.

From the time of Kraepelin and Freud, psychiatry has grown so rapidly that another volume, greater in size than this, would be required even only to suggest recent progress in dynamic psychiatry. Mental medicine is at the threshold, at last, of producing results in all spheres of mental maladjustments. Criminals are now being treated to prevent crime, and children are being given guidance to prevent mental disease. It is possible for the maladjusted married couple to secure aid in overcoming emotional friction.

And so concludes the story of the pioneers in mental medicine—men who struggled to produce the science which today is on the verge of making life happier and healthier for all mankind.

THE END

INDEX

- Academy of Medicine (French), 165, 175, 229-230, 251, 264
Academy of Medicine (Vienna), 317
Academy of Mesmerism, 232
Academy of Science (Prussian), 238
Academy of Sciences (French), 229
Accidents of everyday life, 326
Adler, Alfred, 330-332, 335
Aesclepiades, 8, 12
Alcoholism, 277
 Chronic, 205
 Effect on mental process, 300
Alexandrian physician, 7, 12
Alienist, 58
Alzheimer, Alois, 307
Amberg, Emil, 301 footnote
Anesthesia, 167, 280
Anthropology, Society of, 176, 178-179
Antommarchi, Francisco, 136
Antonelli, Cardinal, 116
Aphasia, 182, 191-193
Apoplexy, 40, 174, 177
Arasistratus, 12
Aretaeus, 5-10, 12
Aristotle, 7, 173
Arsphenamine, 208
Arteriosclerosis, 292
Ashburner, 255
Association for the Advancement of Science (British), 182
Attendants, 79, 86-89, 198
Aubertin, Ernest, 176-179
Aurelius, Marcus, 16
Autopsies, 173, 181, 195, 275, 278, 290, 302, 316-317
Azam, 264

Babinski, G., 283
Bacillus, Tubercule, 293
Bacon, Francis, 47
Baillie, Jean Sylvain, 236
Baquet, 233, 240

Beaumont, William, 144
Bed rest, 84
Behaviorism, 299
Belhomme, 175
Bell, Luther, 98
Bell, Sir Charles, 133, 146-149, 152, 196
Bellevue Hospital, New York, 88-89
Bernard, Claude, 152-169, 201, 212, 275, 292, 313, 334
Bernheim, Hippolyte-Marie, 266-269, 320, 335
Bertrand, 241
Bicêtre, La, 51, 54-55, 58-59, 65-66, 69-70, 73-74, 76, 178-180
Biogenetic law, 143
Bleuler, Eugen, 304
Blindness, 142, 217, 224-226
Blood letting, 11
Blood pressure, 160
Bologna, Italy, 18, 20, 26
Bonaparte, Lycée, 271
Borgia, Cesare, 18
Bosch, Councilor Von, 215-216
Böttiger, 128
Bouillaud, Jean-Baptiste, 173-175, 177, 207, 270, 277, 284, 289
Braid, James, 260-265, 267, 284
Brain, 13-17, 21, 23, 26-27, 37, 39-41, 48-49, 70, 124, 132, 137, 139-140, 144-147, 159, 169, 176-177, 181, 183, 185, 187, 189, 196, 198, 207, 253, 274, 278, 280, 282, 302, 307, 335
 cyst, 181
 diseases of, 174, 193, 297
 hemorrhage of, 174
 (see Werfel, 177, 192)
 lobes of, 174-179
 motor area of, 188
 physiology of, 132, 135, 137, 161, 334
 structure of, 132, 176
Brain function, Gall's theory of, 124, 126, 129, 293

INDEX

- Brain surgeon, 144
 Brain tumor, 142, 174, 186, 292
 Breuer, Joseph, 318-319
 Bright's Disease, 186
 Broca, Pierre Paul, 177-182, 184, 193, 196, 203, 277
 Brown-Séquard, Charles Edouard, 166-172, 185, 280, 284, 292, 313, 334
 Brücke, Ernst, 317, 321
 Butler, Cyrus, 101-102
 Butler Hospital, 102
 Cagliostro, Count, 231
 Calcar, John Stephen, 34
 Cambridge, University of, 246
 Cameron, Simon, 120
 Cassandra, 9
 Castration complex, 331-332
 Catatonia, 303-304
 Cathartic method, 321, 329
 Cerebellum, 13, 41, 45, 177, 189
 Cerebrum, 13, 41, 142, 150
 Channing, William Ellery, 98
 Charcot, Émile, 271
 Charcot, Eugène, 271
 Charcot, Jean-Martin, 167, 170, 237, 254, 270, 286, 290-292, 295, 313, 316-318, 320, 322, 335
 Charcot, Jean, 271
 Charlatain, 228-229, 232-233
 Charles I, King of England, 46-47
 Childbirth, painless, 261, 265-266
 Chiropractor, 231
 Civil War, 120
 Clark, Sir James, 77
 Clinic, Recorder's Court Psychopathic, 210, 302 footnote
 Columbus, Christopher, Sailors of, 202
 Commodus, 16
 Commune, the, 285
 Compulsion, 323
 Confusion, mental, 207
 Congress, United States, 110
 Conolly, John, 74-79, 82-83, 86, 90, 114, 314
 Continuous tub, 311-312
 Convulsions, 4, 223, 226, 234, 240, 279, 314
 Coolidge, Calvin, 189-190
 Corvisart, Jean Nicolas, 135-136
 Couthon, Georges, 61-63
 Couveillier, 73
 Criminal Court, 210
 Criminal Insane, Institution for, 210, 315
 Criminals, 124, 128-131, 137, 336
 Criminology, modern, 130
 Cuvier, Baron George Chrétien Léopold Frédéric Dagobert, 134
 Danvers (Massachusetts) Almshouse, 95
 Dark Ages, 18
 D'Arsonval, 165
 Darwin, Charles, 139, 143, 145
 Davy, Sir Humphrey, 134
 Daydreaming, 313
 Deafness, 263
 Decerebration, 138
 of pigeon, 138-141
 of frog, 141
 Deities, Greek, 5-6
 Delusions, 28, 297, 305
 of grandeur, 200, 204, 207
 Dementia (Demented person), 54, 204, 270, 291, 294, 304
 Dementia Praecox, 304, 306-307, 312
 Democrats, 109
 Depression, 68, 302
 Descartes, René, 42-46, 49, 146, 291
 D'Estlon, Charles, 230, 235
 Deterioration, mental, 303, 306
 Diagnosis, 287-289
 Digitalis, 267
 Dix, Dorothea Lynde, 91-120, 314
 Dobbin, Representative, 103
 Dreams, interpretation of, 322-323
 Dubois, Jacques, 30-35
 Dupotet, 241
 Dura mater, 14, 204
 Earlswood, Institution for Feeble-minded, 78
 East Cambridge Massachusetts House of Correction, 94
 East India Company, 256
 Edinborough, University of, 256
 Ego, the, 333
 Ego drive, 330
 Ehrlich, Paul, 208
 Electrical force, 220
 Eliotson, John, 246, 248-255, 260-261, 265
 Eloise Hospital, 211
 Endocrine gland, 255, 313, 334
 Endocrine gland, treatment of, 315
 Endocrine glands, disease of, 313-314
 Endocrine glands, internal secretion of, 259, 172
 Endocrinology, 159, 334
 Epilepsy, 187-189, 273, 279-280, 296
 Epilepsy, traumatic, 3, 12
 Epileptic fit, 68, 187, 189
 Erbe, Wilhelm Heinrich, 318, 321
 Esdale, James, 256-260
 Esmarch and Jessen, 202, 204-206
 Esquirol, 71, 115, 203
 Evolution, 143
 Exercise and Recreation, 82, 311, 313
 Faith healing, 284
 Father attachment, 319, 329

INDEX

- Father rejection, 328
Father-substitute, 325
Fatigue, 262, 267
Fears, morbid, 197, 321
Felton, Samuel, 119
Ferrier, David, 141
Fever, artificial treatment of, 212
Florence, Italy, 25
Flourens, Marie-Jean-Pierre, 134, 138-141,
 145, 174, 177, 187
"Flux," 5
Food, 61, 82, 294, 314
France, College of, 152, 157, 166, 171
Franco-Prussian War, 170
Franklin, Benjamin, 236
Frederick II, 20
Free association, method of, 314, 324, 329
French Revolution, 51, 53, 57, 59-60, 69,
 237
 Committee on Public Safety, 61
 Commune, 60-61, 69
Freud, Sigmund, 9, 26, 191, 231, 269, 276,
 314, 316-317, 320-322, 324, 326-329,
 331-332, 335-336
Fritsch, Gustav, 187-188
Fulton, John Farquhar, 148

Galen, 12-13, 15-17, 21, 28-29, 33, 35
Galileo, 42, 45
Gall, Francis Joseph, 122-145, 147, 173-
 174, 177-178, 182, 194, 196, 214, 227,
 231, 270, 273-274
Galvani, Luigi, 240
Gassner, Johann Joseph, 220
Geneva, University of, 171
George, John D., 150
Georget, 241-242
Girardin, Saint Marc, 154
Glands, function of, 158, 171
Glandular treatment, 172
Greek literature, 9
Greek physician, 7, 9
Grey, Lord, 114
Griesinger, Wilhelm, 289-297, 302, 305
Guillotine, 237
Gull, 77-78
Guy's Hospital, 246
Gypsies, 121-122, 322-323

Hall, Marshall, 149-151, 189, 196, 254-255
Hallucination, 197, 292, 294-295
Hanwell Asylum, 76-77, 79
Harvey, William, 40, 42, 230
Head, Henry, 193
Hebephrenia, 304
Hell (Hehl), Father Maximilian, 216-217,
 219
Helmholtz, Hermann, 185

Herophilus, 12-14, 39
Hippocrates, 7, 9-10, 12, 276
 Hippocratic oath, 287
Hitch, 87-88
Hitze, Eduard, 187-188
Hollander, Bernard, 136
Holmes, Oliver Wendell, 98
Hooke, Robert, 42
Hôpital Général L', 51-52, 54
Hôtel Dieu, 241, 264
Howe, Samuel Gridley, 98
Hufeland, Von, 127, 132-133
"Humors," 7
Hutchinson, Jonathan, 184
Hydrotherapy, 10, 311-312
Hypnosis, 242, 244, 250, 263-265, 268-270,
 274, 283-285, 319-320, 324, 335
Hypnotic sleep, 254
Hypnotic stages, 283
Hypnotic treatment, 254, 284, 318
Hypnotism, 264, 283
Hypnotists, 293
Hysteria, 218, 223-224, 253, 278, 280,
 282, 284, 285, 296, 317, 320-321, 335
Hysterical insane, 279, 296
Hysterical symptoms, 318, 320
Hystero-epilepsy, 279, 284

Idiocy, 11, 270
Idiots, 70-71
Impotence, 322
Incest, 329
Infantile paralysis, 277
Infantile regressions, 328
Inferiority feelings, 253
Inferiority reaction, 330
Insane Asylum, 71, 74, 77, 81
 inmates, 124
Insane Hospital, commitment to, 300
Insane Houses, private, 113
Insanity, 28, 30, 68, 197-198, 209, 291-
 293, 295-297, 309
Institute of France, 134-135, 138
Insulin, treatment by, 313
Intelligence, 39, 176-177, 181
Intelligence test, 137

Jackson, John Hughlings, 166-167, 182,
 184-193, 195-196, 203, 212, 272, 274,
 292, 313-314, 334
James, William, 298
Jenner, Edward, 205

Kahlbaum, Karl Ludwig, 303-304
Kemal Pasha, 118
Koch, Robert, 265
Kraepelin, Emil, 297-307, 311, 336
Krafft-Ebing, Richard, 205

INDEX

- La Fontaine, Charles, 260-261, 263
Laryngologist, 276
Lavoisier, Antoine Laurent, 227, 236
Legislature
 Alabama, 109
 Massachusetts, 91, 97-98
 New Jersey, 104, 106
 New York, 102
Liébeault, Ambrose Auguste, 264-270, 274,
 283-284
Lincoln, Abraham, 119
Lincoln Asylum, 75
Lister, Joseph, 266
Localization of function, 48
 Brain, 135-137, 139, 176-179, 186, 188-
 189
Localization of speech, 175, 178-179
Locomotor ataxia, 277
London, University of, 75, 77, 249
 Medical College, 251
Lord Provost of Edinburgh, 113
Louis XIII, King of France, 50-51
Louis XVI, King of France, 56
Louis Napoleon, Emperor of France, 164
Lower, Richard, 47-49
Loyola, Ignatius, 33
Lunatic Hospital, 60

Maddox, Herbert, 257
Magnetic fluid, 236, 240
Magnetic healing, 241
Magnetic ring, 233
Magnetism, 216-217, 221, 228, 233, 243-
 244, 262
Magnetism, Animal, 220, 240, 242, 283
Magnets, 217-220
Majendie, François, 133, 146, 148-149,
 152, 156-158, 173, 194, 196, 275
Malaria treatment, 201, 209, 211, 314
Malingering, 296
Man, prehistoric, 1-4, 27
Mania, 12, 303
Maniac, 6, 54, 270, 302, 312
Manic Depressive psychosis, definition of,
 302
 Manic Depressive, 303, 308, 311, 314
Mann, Horace, 98
Marie, Pierre, 283
Masculine protest, 331
McNeile, Reverend, 263
Medical Students, 68, 75, 77, 246, 285, 300
Medical treatment, 285
Medicine man, 2
Medulla Oblongata, 150
Melancholia, 4, 10, 12, 54, 270, 294, 302-
 303, 333
Memory defect, 319
Mental disease, cause of, 292, 296, 313
 Mental disease, classification of, 291-293,
 296-297
 Mental disease, prognosis of, 301
 Mental disease, treatment of, 287, 297
 Mental disorder, textbook on, 290-291
 Mental hospital, 81
 Mental treatment, 260-286, 312
 Mercier, Charles A., 190-191
 Mercury, treatment with, 208
 Mesmer, Friedrich Anton, 135, 194, 214-
 245, 249, 264, 273, 335
 Mesmerism, 232, 234-236, 238-239, 242,
 244, 249-257, 259-261, 263-264, 283
Metabolism, 282
Metropolitan Free Hospital, 184
Middle Ages, 28, 30
Migazzi, Cardinal, 226
Moison, Madame de, 53
Mondino, 21, 23-24
Moral treatment, 70-71
Mother attachment, 329
Movement, voluntary, 150-159
Mozart, Wolfgang, 214-215
Murder, 305
Muscle, involuntary, 159-160
Muscle, voluntary, 159
Muscular action, 149, 159
Muscular atrophy, 277
Music therapy, 8, 333

Nancy (France), 265-269, 320
Napoleon I, Emperor of France, 73, 134-
 136, 138, 331
Napoleon III, Emperor of France, 169
Napoleonic Wars, 273
Narcissism, 332
National Hospital for Paralyzed and Epi-
 leptic, Queen's Square, 170, 184, 185
National Socialism, 333
Nerve, 280
Nerve Cell, 145, 189, 197
Nerve Impulse, 45-46, 146
Nerve, Motor, 133, 146
Nerve, Sensory, 133, 146
Nerves of Eye (Optic Nerve), 185, 196,
 262
Nervous System, 144, 146, 149, 158, 170,
 172, 186, 201, 207, 212, 254, 262,
 292, 307, 317, 334, 336
Nervous System, Gross anatomy, 35-36
Nervous System, Physiology, 38
Nervous System (Sympathetic), 150, 159,
 160, 169
Nervous System (Syphilis of), 199, 203,
 207
Neuberger, Max, 148
Neurological cases, 286
Neurologist, 141, 149, 201, 282

INDEX

- Neurologist, Definition of, 183-184, 285
 Neurology, 126, 185, 191, 194, 283, 316
 Neuropsychiatry, 126, 137
 Neurosis (Neurotic Paupers), 226, 234, 273, 322, 331, 335
 Neurotic Patients, 276
 Neurhypnosis, 263
 Nichols, John T. G., 94
 Nodier, Charles, 167
 Noguchi, Hideyo, 207
 Nursing, 87
- Oedipus Complex, 328
 Oesterlin, Franzl, 216-218, 223
 Open Door System, 84, 311
 Open wards, 83, 86
 Ophthalmoscope, 185
 Optic Atrophy, 223
 Osteopath, 231
 Oxford, 46, 47
- Padded cell, 78-79, 83
 Padua (Italy), 26, 33-34, 38
 Paracelsus (Phillipus Aureolus Theophrastus Paracelsus Bombastus Von Hohenheim), 28, 56, 222-226
 Paralysis, 41, 167, 174, 178, 180, 181, 183, 186, 187, 204, 218, 223, 254, 277, 278, 282, 286, 319, 324-325
 Paralysis, agitans, 286
 Paralysis, artificial, 282
 Paralyzed cases, 286
 Paranoia, 12, 293, 305
 Paresis (General Paralysis of Insane), 198, 202-205, 207-213, 289, 335
 Paris, University of, 58, 72
 Parker, 254
 Pasteur, Louis, 165, 265, 335
 Pathologist, definition of, 201
 Pathology, 40
 Patient, hysterical, 167, 218, 241, 242, 319
 Penology, 131
 Persecution, delusions of, 305, 306
 Philip of Spain, 36
 Phrenologist, 121, 178
 Phrenology, 121-122, 135, 175
 Pia mater, 14, 204
 Pineal Gland, 45
 Pinel, Philippe, 55-74, 90, 115, 178, 203, 270, 273, 289, 314
 Pius IX, 116, 117
 Plato, 9
 Pleasure reactions, 327
 Prison, 81, 83, 128, 130-131, 315
 Ward, 88
 Prochaska, 151
 Psychiatric treatment, 71
- Psychiatrist, definition of, 183-184
 Psychiatry, beginning of, 246
 Psychiatry, Forensic, 301
 Psychoanalysis, 276, 314, 325, 328, 329, 336
 Psychoanalysis, Freudian, 314, 322-323
 Psychoanalytic technique, 325
 Psychoanalytic theory, 324
 Psychological treatment, 219, 244
 Psychology, 126, 137, 139, 204, 244, 292, 299, 334
 Individual differences, 137
 Psychology, Adlerian, 330
 Psychology, comparative, 40, 124
 Psychology, experimental, 298, 299
 Psychology, Freudian, 163, 313
 Psychology, social, 299
 Psychosis, 307, 335
 Pussin, 60, 69, 70
 Puysegur, Count de, 239-241
 Puysegur, Marquis de, 238-240
- Quack, 28, 126, 135, 175, 178, 227, 231, 258
 Quincke, 207
- Race, Victor, 240-241
 Radiotherm, 213
 Rapport, 221, 243
 Rationalization, 321
 Reflex, 45, 152, 189, 196, 197
 Pupillary, 199
 Rejuvenation, 171
 Republicans (French), 169
 Restraint, 70, 75-77, 79
 Chemical, 80
 Mechanical, 75, 80
 Moral, 70, 76
 Physical, 70
 Rete mirabile, 32
 Retina, 185
 Retzer, Baron, 124
 Robespierre, Maximilien Marie Isidore, 61
 Rochoux, 176
 Rostan, 241
 Royal College of Surgeons, 170, 183
 Royal Commission, 114
 Royal Medical and Chirurgical Society, 254
 Royal Medico-Psychological Association, 86
 Royal Society, 47
- Saint Bartholomew's Hospital, 183
 Saint Clair de Ville, Henry, 163
 Saint-Just, Antoine Louis Léon Florelle de, 61
 Saint Martin, Alexis, 144
 Saint-Michel, Sister, 53
 Saint Vitus dance, 250

INDEX

- Sakel, Manfred, 513
Salpêtrière, La, 50-53, 66, 69, 71-73, 76, 87, 241, 264, 270, 273-274, 279, 280, 285-286
Salvarson, 266
Schaudinn, Fritz, 206-207
Schizophrenia, definition of, 304-305, 312, 314, 332
 Insulin treatment, 313
Schleiden and Schwann, 145
Servetus, 31-32, 38, 45
Sex glands, 8
Sex interest, 279
Sexual adjustment, 253-254
Sexual conflict, 322, 324-325
Sexual practices, 321
Sexual suppressions, 330
Sexualism, 218, 253, 317, 328
Sforza, Ludovico, 24
Shackles, 54, 60, 75-76, 97
Shaftesbury, Anthony Ashley Cooper, 7th Earl of, 114
Shaman, 2
Simpson, Sir James, 265
Single rooms, 83-85, 311
Sinuses, 14
Social worker, 312, 314-315
Society of Apothecaries, 183
Society of Harmony (Paris), 238
Sorbonne, the, 152
Speech, 192
Speech center, 174-176, 179, 180, 197
Speech defect in paresis, 200
Spieldmeyer, W., 307
Spinal cord, 25, 27, 39, 41, 45, 48, 140, 146-148, 150, 167, 189, 280, 282
Spinal cord, diseases of, 174
Spinal puncture, 207
Spirits, 14, 307
Spirits, animal, 16-17, 37
Spirits, natural, 16
Spirits, vital, 37, 39
Spurzheim, Johann Christoph, 133, 147
Stanton, Edwin McMasters, 120
Stethoscope, 246-248, 310
Stift, Von, 124
Storck, Von, 125
Strait Waistcoat (Strait Jacket), 63, 75-76, 78
Strassburg, University of, 122
Subconscious, the, 321
Suggestion, 217-219
Suggestive treatment, 228
Surgery, antiseptic, 266
Surgery, painless, 254, 257-259
Symptom, 298
Syphilis, 202-203, 205, 207, 210, 266, 274, 289, 296
 cause of, 206
 test for, 206
Taylor, James, 194
Temperature changes, 282
Tertullian, 12-14
Thermometer, clinical, 276, 290
Tiffany, Francis, 104
Treatment, general, 287, 315
Tremor, 277, 278, 321
Trenton (New Jersey) State Hospital, 106, 120
Trepchine, 3, 4
Tuberculin, treatment, 208-209
Tuberculosis, 293
Tuke, William, 75, 112
Turnbull, 88
University College of London, 151, 249, 252
University Hospital (London), 250
Vatican, 115-116
Velpeau, 264
Venesection, 67, 250, 255, 295
Venice (Italy), 18, 33
Ventricles, 23-25, 38-39
Verrocchio, 24
Vesalius (Andrew Wesel), 31-36, 40, 42, 46, 49
Vienna, University of, 122, 208
 Psychiatric Clinic, 208
Vinci, Leonardo da, 24-28, 32, 38, 49
"Vital Principle," 157
Volta, Alessandro, 240
Voltaire (Francis Marie Arouet), 227
Wagner-Juaregg (Julius Wagner Ritter von Juaregg), 208-209, 289
Walker, 262
Walker, Alexander, 147
Walter, 127-130, 132
Ward, 254
Wassermann, August von, 206
Waxlike flexibility, 306
Webster, Daniel, 169
Werfel, 40-41
Willis, Thomas, 46-49, 56, 67, 289
Wish, murder, 323
Wish, sexual, 319, 323
Wolfart, 238
Worcester (Massachusetts), State Hospital, 96
Wren, Sir Christopher, 49
Writing, 192
Wundt, Wilhelm, 298-300
York Medical School, 182
York Retreat, 75, 112

